



Dairy Goat Farming Practices

***for Specialty Cheese & Other
Products***

**A report for the Rural Industries Research
and Development Corporation**

by A.K. Stubbs and G.L. Abud

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Foreword

The sector of the dairy goat industry involved with cheese production in Australia grew rapidly over the last decade in response to increasing market demand for goat cheese. By the turn of the decade, supply had exceeded domestic demand and attention was turned towards export markets and other products. The industry has now reached the point where it needs co-ordination and direction to be a viable and sustainable rural industry of the future.

Various technical and commercial aspects of production, processing and marketing have been investigated through this project and its predecessor to provide a firm basis for industry advancement. However, further research, development and extension will be needed to consolidate the gains made to date, and to exploit future opportunities. The industry should play a leading role in guiding these activities.

This publication outlines progress made by the industry and gives recommendations for future initiatives to help secure and progress the position achieved. Proposals made will assist careful guidance of development towards a profitable, self contained and controlled Australian Dairy Goat Industry, with an emphasis on specialty cheese production.

This project was funded from RIRDC Core Funds which are provided by the Federal Government.

This report, a new addition to RIRDC's diverse range of over 900 research publications, forms part of our New Animal Products R&D Program, which aims to accelerate the development of viable new animal industries.

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Simon Hearn

Managing Director

Rural Industries Research and Development Corporation

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Much of the information collected, opinions formed and conclusions reached would not have been possible without the willing co-operation of many producers, manufacturers, distributors and marketers, particularly survey respondents, and representatives of government, industry and service organisations. Their inputs are gratefully acknowledged.

A key component of the project was the Focus Farm study and Field Days, held on the properties of Jo & Robert Hall, Michael & Stacey Rocca and Malcolm & Darlene Barton. Their co-operation and hospitality was greatly appreciated. Considerable assistance was given at the Rocca farm by Tasmanian Department of Primary Industries, Water & Environment officers, Jonathan Porteous and Basil Doonan. Special thanks are due to these two men.

The computer program developed especially for dairy goat farms was expertly written by Werner Osewald of Culcairn, NSW, and assistance with testing the program was given by Bob Maczkowiack, Gatton, Qld; Sandra & Terry McPhee, Pheasant Creek, Vic; and Jonathan Porteous. Their willing contributions are acknowledged.

Those who attended the industry meetings which led to the formation of the Australian Goat Milk Association, and the subsequent officebearers, have played a significant role in the evolution of the industry.

Finally, the other members of the Study Tour group, David Brown of Milawa Cheese and Jo Hall, together with Bruce McGregor and Tony Barker who helped with the report, are thanked for their input to this phase of the project.

About the Authors

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Both authors were engaged in the previous RIRDC project on this subject, "Specialty Goat Cheese – Improving Productivity in Australia", available as RIRDC Publication No 98/116.

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Executive Summary

Introduction

Phase 1 of this project, (RIRDC Publication No 98/116), revealed that there was a dearth of current information and parameters on the actual effects on dairy goat productivity of various approaches to feeding, goat health, and mating. The earlier project (PTP-8A) also revealed a wide range of management practices and levels of production, and a disturbing lack of reliable market data for the specialty goat cheese sector.

Some evidence has been accumulated that there is great scope for more economical milk production by maximising pasture production and use, and techniques are available for achieving consistency of supply.

There was seen to be an urgent need to provide on-farm demonstration and measurement of the effects of generally accepted, preferred methods of feeding, health and mating management on goat herd productivity, complemented by extension of the information gained through publications and other means, and provision of benchmarks to farmers through the survey technique.

The results of the project will give confidence to dairy goat farmers to adopt recommended practices, through practical demonstration of their effects, and benefit the dairy goat industry by establishing guidelines for economical and consistent supply of high quality milk for production of cheese and other products.

Other important benefits will include: improved milk quality and consequently cheese quality ensuring satisfaction of market demands for uniformity and reliability of product; improved export and import competitiveness; co-ordination of the industry through networking and information exchange to assist development of an autonomous and sustainable specialty goat cheese industry.

Objective

Definition and demonstration of best practice procedures on-farm in feeding, health and mating management to achieve consistent quantity and quality of supply of goat milk at minimum cost for specialty cheese making.

Methodology

There were several separate but inter-connected phases during the course of the project from 1998 to 2001. They were as follow:

Dairy Goat Focus Farms

The major component of the project was conducted on two "Focus Farms", one each in Victoria and Tasmania. Farm management practices were followed on these farms during the project duration, with the aim of implementing the most economical practices, consistent with the objective, at all times. The opportunity for examination of the effects of some variation in practices was taken when possible. Focus farm performance was measured against other dairy goat farms through the annual Dairy Goat Farm Survey. Several field days were held on each farm to demonstrate results achieved and discuss the management practices in operation.

Computerised Recording System

An intended outcome of the Focus Farm component of the project was the development of dairy goat farm management data recording and reporting software for operation on a personal computer. A pilot Dairy Goat Farm PC system has been developed.

Technical Information System

This phase of the project was continued from PTP-8A, and included revision and updating drafts of Dairy Goat Notes prepared to date. In addition, Notes were produced on other priority topics and a loose leaf manual produced. (RIRDC Publication No 02/025).

Dairy Goat Farm Surveys

The system used in PTP-8A for annual collection of vital statistics on herd and goat numbers, location and production, and collation of data on production, management, herd improvement practices and cost of production in 1996/97, was continued for 1997/98 and 1998/99.

Goat Cheese Market Surveys

In response to the identified lack of accurate market data, market surveys were conducted to gather data on specialty goat cheese production, sales and imports, by value, type and market segment. Two surveys were conducted.

Industry Development

As an important byproduct of the project, and to continue the momentum from PTP-8A, industry co-ordination and development was fostered and further investigated. An industry organisation was established representing all sectors of the commercial goat milk industry.

Overseas Study Tour

Towards the conclusion of the project an industry study group of four persons, representing sectors of the industry, visited France to compare project achievements and Australian developments in farm management, herd improvement, cheese production and marketing techniques with practices in a more mature production and marketing system.

Results & Discussion

Focus Farms

- Both farms, 'Jarracada' (Vic) and Anroc (Tas) have demonstrated that dairy goats can be farmed similarly to cows, with most feed being obtained by grazing pasture, the cheapest feed input.
- Neither farm shedded goats have shown that exposure to weather whilst grazing, contrary to some beliefs, has little adverse effect on production or goat health.
- Goats' grazing habits and palatability preferences appear to preclude the intensive, close grazing possible with dairy cows, but not efficient pasture utilisation through strip grazing.
- Different production levels at the two farms may reflect the relative length of time spent in building and culling the herds more than any other factor.
- The degree of tolerance of nematode parasite infestation is markedly different between the farms, partly due to concern about predisposition to Yersiniosis at Jarracada. Time will tell whether the moderate levels at Anroc can be sustained.
- Somatic cell count levels also differ considerably between the farms, being surprisingly low at Anroc. The explanation for this contrast is unclear.
- The different kidding and production patterns reflect their cheese makers' requirements; Jarracada attempting an even year round supply, and Anroc a seasonal supply.
- It is significant that both farmers found great value in attending dairy cow discussion groups and used agricultural advisors from time to time.

Computerised Recording

A pilot version of a dairy goat farm computer program, entitled “Capri”, has been produced for operation with a Microsoft Access 2000 database. Further refinements to the program are intended in conjunction with the Computer Sciences Department at Latrobe University.

The program is designed to allow easy data entry, querying and reporting through prepared Forms, Tables and Reports, directly applicable to the needs of commercial dairy goat farms.

Technical Information

A “Dairy Goat Notes” Manual has been published separately (RIRDC Publication No. 02/025). Sections and subjects covered include: Farm & General; Milking Management; Herd Management; and Health.

Farm Surveys

- The dairy goat industry is a typical agricultural industry with a wide variation between farms in management practices, production levels and productivity parameters. Many farms appeared to be operating with a less than commercially viable herd size.
- Most farms were planning to increase herd size and shed capacity, but these aims will depend on product demand over time. There is generally insufficient attention being paid to achieving a more even year round supply, consistent with market needs.
- The leading farms had a low ratio of brought in feed to production level and generally had the larger herd sizes. Pasture and crop establishment, maintenance and production, and grazing management, are farming practices with considerable potential for application in dairy goat farming to improve productivity.

Market Surveys

- There is an established market for goat cheese in Victoria. Food service and supermarkets are the biggest customers. The trend appears to be for wider use. The surveys have identified a ‘widespread’ range of customers. Retail sales were generally described as ‘steady’, but some distributors identified increased usage. This seems to suggest more outlets.
- Quality issues are linked to consumer expectations and are difficult to objectively quantify. There were no complaints about quality in the second survey. ‘Smooth and creamy’ is a fairly constant ideal. Seasonal shortages were not an issue for those surveyed, probably due to cheesemakers’ ability to stockpile.
- Knowledge about goat cheeses remains limited. Flavour expectations vary between customers and they have only experience to guide them in selection. Extension of use in cooking would assist the retail end, and recipes were requested.
- Some retailers mentioned lack of variety, but on further discussion it was found that they were unaware of many varieties that are available from their current distributor/s. Also some distributors have a limited range. Gaps in the market can occur as has happened recently with a Norwegian hard cheese being no longer available, and retailers were unaware of the local product. There appears to be considerable opportunity for information and promotion of the range of goat cheeses across many sectors of the food industry and perhaps for expansion of the range.
- Imported product poses real and potential problems, although the exchange rate has been a positive factor. Fetta suffers most from import competition, and related to this is the continuing problem of the source of milk in fetta (an issue of international interest at the present). Chevre imports remain a potential threat.
- Health issues are a minor consideration but do come up. Information is needed here too.
- At farmer/cheesemaker level, availability and quality issues appear to have been addressed as far as the cheese marketplace is concerned. The issue of stockpiling is one that cheesemakers need to pursue with farmers, and costings for out of season milk should be established. It has been demonstrated that out of season kidding is feasible in Victoria under pasture based systems.

Industry Development

The major result from industry liaison and meetings was the eventual formation of the "Australian Goat Milk Association" (AGMA) in February, 2000, for the purpose of representing, promoting, co-ordinating and monitoring the Australian dairy goat industry.

The AGMA Committee includes producers and processors, and membership covers all States.

Several bi-monthly newsletters have been produced and circulated and a website has been launched.

Study Tour

Observations and lessons relevant to Australia included: economic and social comparisons; regional differences; farming methods; animal health control; genetic improvement and breeding; manufacturing techniques; milk and product quality standards; and approaches to marketing.

Recommendations

Focus Farms

- The industry should foster the concept of Focus Farms, strategically located in different climatic regions, to allow monitoring and demonstration of management practices to surrounding dairy goat farmers.
- In addition, dairy goat farmers should be encouraged to associate with dairy cow farmers in discussion groups and at field days to examine the principles behind dairy cow management, eg, feeding and herd improvement, which have relevance.
- The project has revealed that, whilst there are close similarities between farming dairy goats and cows, considerably more work is needed, perhaps in a more controlled situation, to define the relationships between feed intake, growth and milk production.
- Nematode parasite control appears to be a particular management problem with dairy goats and has tended to promote relatively expensive husbandry methods. More research is needed into anthelmintic and other control methods.
- Dairy goats generally have much higher levels of somatic cell count than the accepted dairy cow standards, yet there is evidence that yield and quality of manufactured goat milk products can be adversely affected. More precise data is needed to give farmers targets to aim for.
- Genetic improvement in dairy goats lags well behind that of dairy cows. Despite the relatively small size of the industry, genetic principles should be extended, organised herd testing recommended for all, and co-operative breeding schemes promoted.

Computerised Recording

- The Program is very much a 1st version and despite numerous improvements during its development there will be many features that can be added to make it more user friendly and suitable. The industry should attempt to co-ordinate further development to ensure the program remains applicable to a commercial dairy goat farm and to have it used as widely as possible.

Technical Information

- The Manual was designed as a loose leaf publication to enable easy updating from time to time. This should be conducted on a regular time scale, perhaps every five years, by an industry nominee with appropriate funding sought for the task.

Farm Surveys

- Future industry management will rely heavily on measuring farm activities on a regular and routine basis. The industry should conduct this type of comprehensive farm survey, at least every two years, to guide future planning and provide farm benchmarks.

Market Surveys

- An educational campaign is needed. At retail level, description of cheeses, recipes and serving suggestions, storage hints, shelf life, nutritional and other information is required. Printed material and display systems should be provided. Well-known chefs should be approached to participate.

Restaurants would welcome description of cheeses. Some distributors would welcome the range of information.

- The ADC should promote the results of the Australian Specialist Cheesemakers' Association (ASCA) Cheese Show, of which it is a sponsor. Goat cheeses do well there. Invitations to the ASCA Cheese Show should be issued for future market survey participants, and perhaps a free entry could be offered for one or more participants in the future, as an incentive to fill out the forms.
- Identification and labeling of particular cheeses with regard to flavour and texture (and related to this, maturing and shelf life) is needed. There may be opportunities for new style cheeses, but the market size for these may be small. A common 'language' related to the above should be developed; cf meat 'language' used by Meat & Livestock Australia.
- The source of milk in imported fetta should be investigated.
- Monitoring of price issues and price importance in the marketplace should be undertaken.
- Use of the Internet for promotion and ordering/sales, perhaps by a distributor, or a group formed for the purpose.
 - Market surveys should be continued from time to time by AGMA and ASCA.

Industry Development

- It is crucial that the industry, through AGMA, presents a united front to promote and advance Australian dairy goat milk products and to attempt to regulate supply according to market estimates.
- AGMA must continue to promote membership so that it is seen to be truly representative of the majority of the industry.
- AGMA should continue to develop several of the outcomes of this project, particularly the Computer Program and the Dairy Goat Note Manual, and should implement a Farm Survey on a regular time scale.

Study Tour

- The industry should attempt to organise co-ordinated study tours occasionally to countries with significant dairy goat industries.

1. Introduction

Phase 1 of this project, (PTP-8A), revealed that there was a dearth of current information and parameters on the actual effects on dairy goat productivity of various approaches to feeding; via pasture, supplements and concentrates; to goat health, through worm control measures, housing and vaccination schedules; and to mating, by use of drugs and other influences on cycling patterns. There is some literature available on these subjects but it is generally either out of date, aimed at fibre or meat production, or inadequate in providing guidance to current day dairy goat farmers.

Some evidence was accumulated, through RIRDC Project DGS-1A and follow up Production Demonstration Field Days during PTP-8A, that there is great scope for more economical milk production by maximising pasture production and use. A Farm Survey conducted in PTP-8A revealed a wide range of management practices and levels of production with obvious room for improvement on the majority of dairy goat farms. Another RIRDC project (UMO-18A) investigating year round supply of goat milk has recently revealed an effective method of achieving consistency of supply.

To capitalise on this work there was seen to be an urgent need to provide on-farm demonstration and measurement of the effects of generally accepted, preferred methods of feeding, health and mating management on goat herd productivity over a full lactation. This needed to be complemented by extension of the information gained through publications and other means, and provision of benchmarks to farmers through the survey technique.

Project PTP-8A also revealed a disturbing lack of reliable market data for the specialty goat cheese sector which impinges greatly on producers' and processors' planning regarding cost, levels and uniformity of production. More specific market information is a vital requirement to ensure stable and sound growth of the industry.

The results of the project will give confidence to dairy goat farmers to adopt recommended practices, through practical demonstration of their effects, and benefit the dairy goat industry by establishing guidelines for economical and consistent supply of high quality milk for production of cheese and other products.

Other important benefits will include: improved milk quality and consequently cheese quality ensuring satisfaction of market demands for uniformity and reliability of product; improved export and import competitiveness; co-ordination of the industry through networking and information exchange to assist development of an autonomous and sustainable specialty goat cheese industry.

2. Objective

Definition and demonstration of best practice procedures on-farm in feeding, health and mating management to achieve consistent quantity and quality of supply of goat milk at minimum cost for specialty cheese making.

3. Methodology

There were several separate but inter-connected phases during the course of the project from 1998 to 2001. They were as follow:

Dairy Goat Focus Farms

The major component of the project was conducted on two "Focus Farms", one each in Victoria and Tasmania. Farm management practices were followed on these farms during the project duration, with the aim of implementing the most economical practices, consistent with the objective, at all times. The opportunity for examination of the effects of some variation in practices was taken when possible. Focus farm performance was measured against other dairy goat farms through the annual Dairy Goat Farm Survey. Several field days were held on each farm to demonstrate results achieved and discuss the management practices in operation.

Computerised Recording System

An intended outcome of the Focus Farm component of the project, for ease of monitoring and recording physical and financial items, was the development of dairy goat farm management data recording and reporting software for operation on a personal computer. Options considered included the evaluation of currently available software packages for possible modification to suit dairy goat enterprises, or development of modules specifically tailored for the purpose. A pilot Dairy Goat Farm PC system has been developed.

Technical Information System

This phase of the project was continued from PTP-8A, and included revision and updating drafts of Dairy Goat Notes prepared to date. In addition, Notes were produced on other priority topics and a loose leaf manual produced. The information was also disseminated through newsletters/magazines, eg., Australian Goat World, AGMA Newsletter.

Dairy Goat Farm Surveys

The system used in PTP-8A for annual collection of vital statistics on herd and goat numbers, location and production, and collation of data on production, management, herd improvement practices and cost of production in 1996/97, was continued for 1997/98 and 1998/99. This included reporting to farmers on interfarm comparisons and to industry on trends and predictions.

Goat Cheese Market Surveys

In response to the identified lack of accurate market data, market surveys were conducted to gather data on specialty goat cheese production, sales and imports, by value, type and market segment. Two surveys were conducted. Liaison and exchange of commercially insensitive information occurred with the Australian Dairy Corporation and other bodies as appropriate. In addition, assistance was provided to plan a survey of export prospects for dairy goat products by the Victorian Department of Natural Resources & Environment.

Industry Development

As an important byproduct of the project, and to continue the momentum from PTP-8A, industry co-ordination and development was fostered and further investigated. An industry organisation was established representing all sectors of the commercial goat milk industry.

Overseas Study Tour

Towards the conclusion of the project an industry study group of four persons, representing sectors of the industry, visited France to compare project achievements and Australian developments in farm management, herd improvement, cheese production and marketing techniques with practices in a more mature production and marketing system. A full report of this visit, with recommendations for future industry development and further research requirements, was produced.

4. Results & Discussion

Focus Farms

Introduction & Aims

It was initially proposed that the major component of the project be conducted on three “Focus Farms”, one each in North East Victoria, Gippsland and Tasmania. These regions were chosen to represent the main Australian goat cheese producing areas. In the first year, 1998, focus farm operation concentrated on the Victorian sites to develop guidelines for monitoring and recording, followed by the Tasmanian site in the second year. Unfortunately, the farm in North East Victoria could not continue into the second year due to pressure of other industry commitments aimed at developing alternative product markets.

Farm management practices followed during the project duration were determined by consultation between the principal investigators, farm owners, and other advisers as needed, with the aim of implementing the most economical practices, consistent with the objective, at all times.

The opportunity for examination of the effects of some variation in practices, eg, worm control, mating management, was taken when possible.

Production, health and herd events, plus variable costs and returns, were monitored regularly on these farms. In addition, the effect of milk supplied through the year on cheese yields and quality was assessed where possible.

The types of records collected included:

Production - total herd milk yield per day and bulk milk composition (protein, fat, total solids, somatic cell count, bacteriological count); individual doe milk yield and composition (protein, fat, SCC) by herd test.

Health & Herd Events - bodyweight and condition scores; faecal egg counts; drenching dates, types and quantities; vaccination schedules; other veterinary treatments; kid rearing details such as growth rates, disease incidence, weaning dates, etc.

Mating Management - mating and kidding dates for does; bucks used; progeny details; synchronisation or induction dates and procedures; pedigree and breed records.

Feeding - fertiliser usage; supplementary feeding (and analysis); soil and plant samples; silage and hay made and fed; pasture feed available; grazing systems.

Costs & Returns - costs of variable inputs; returns from milk and stock sales.

Cheese Production - cheese yields and quality.

Focus farm performance was compared to other dairy goat farms through the annual Dairy Goat Farm Survey.

Seven field days were held on the farms to demonstrate results achieved and discuss the management practices in operation. Three field days were held on each of the farms that continued through to the end of the project, with an average attendance of 19 people.

Farm Summaries

South East Victoria – Jo & Robert Hall, “Jarracada”, Childers, Gippsland

Property Overview & Aims

Jarracada Goat Dairy is located in the temperate, Gippsland region, at an altitude of 400 metres, with an annual rainfall of 1100mm. It has been a dairy goat farm for some years. Arable farm area is 18 hectares of undulating to steep hill country, in 25 paddocks, with fine sandy, clay loam, moderately acid soils. Natural soil fertility is low and has been boosted with fertiliser to acceptable levels of

phosphorus, potassium and sulphur, the major element deficiencies. Pastures are mainly composed of perennial ryegrass, cocksfoot, white clover, and red clover.

Aims at “Jarracada” were:

- 15 milking does per hectare (280 in total)
- All young stock reared on farm
- Closed herd to protect goat health
- All silage needs cut on farm and minimal bought in hay
- Maximum component of high quality pasture in diet
- Grazing rotation to maintain maximum pasture intake and regrowth
- Soil pH of 6.0 and Phosphorus level at 30ppm (Olsen P)
- Year round production of good quality milk (protein 3%, fat 4%)
- Production average of 1250 litres, 50 kg fat and 40 kg protein
- Clear a further 10 hectares to allow higher stock numbers
- Concentrate kidding in autumn for more even supply and higher milk prices

Herd

The milking herd ranged in size from 130 to 210 does during the project (see Fig. 6), varying from season to season according to production aims. It was predominantly Saanen, cross bred with British Alpine and Toggenburg. The majority of does were on their first or second lactation due to increasing herd numbers. Dairy shed design was altered to increase capacity and speed up throughput.

Breeding objectives, in order, were to increase production, improve udders, decrease size (height), increase lactation length, achieve high fertility, plus good temperament and ease of milking. Selection also took account of protein and fat percentages of dams. The herd was closed, with the exception of the occasional introduced buck, to protect goat health. 10 bucks were used for hand mating of does. Oestrus was induced out of season by subjecting maiden does to periods under artificial lighting and use of melatonin, and by hormone treatment plus use of the buck effect for does in the herd.

Kidding pattern has been spread, with peaks in autumn, spring and summer (Fig. 1) to achieve year round production, but the emphasis has shifted to autumn kidding to meet the winter supply shortfalls and return higher prices.

Weights and condition scores were monitored for the first full year of the project. Milking doe weights ranged from 40 to 90 kg according to age and stage of lactation (Fig. 2). Average weight and condition score (adapted from dairy cattle scores – see Dairy Goat Note 3.4) for the year from spring 1998 for a group of 100 does is shown in Fig. 3. Weights peaked in summer/autumn 1999 with onset of kidding and fell slightly in the early stages of lactation. Condition score, apart from spring 1998, was kept at a satisfactory level through attention to feeding regimes.

Kid weights and condition scores were also followed in the early part of the project. Fig. 4 shows a steady increase in weight from birth to 10 weeks of age for kids born in spring 1998. Fig. 5 shows further steady increase in weight for the spring 1998 group and contrasts them with kids born in autumn 1998 whose weight increases were slowing as they approached maturity. The figure shows that both groups grew at a similar rate according to age.

Target weaning weights and ages for kids are 18-22 kg and 10-12 weeks, and for first matings, 40+ kg and 9-15 months.

Fig 1 Jarracada Kidding Pattern

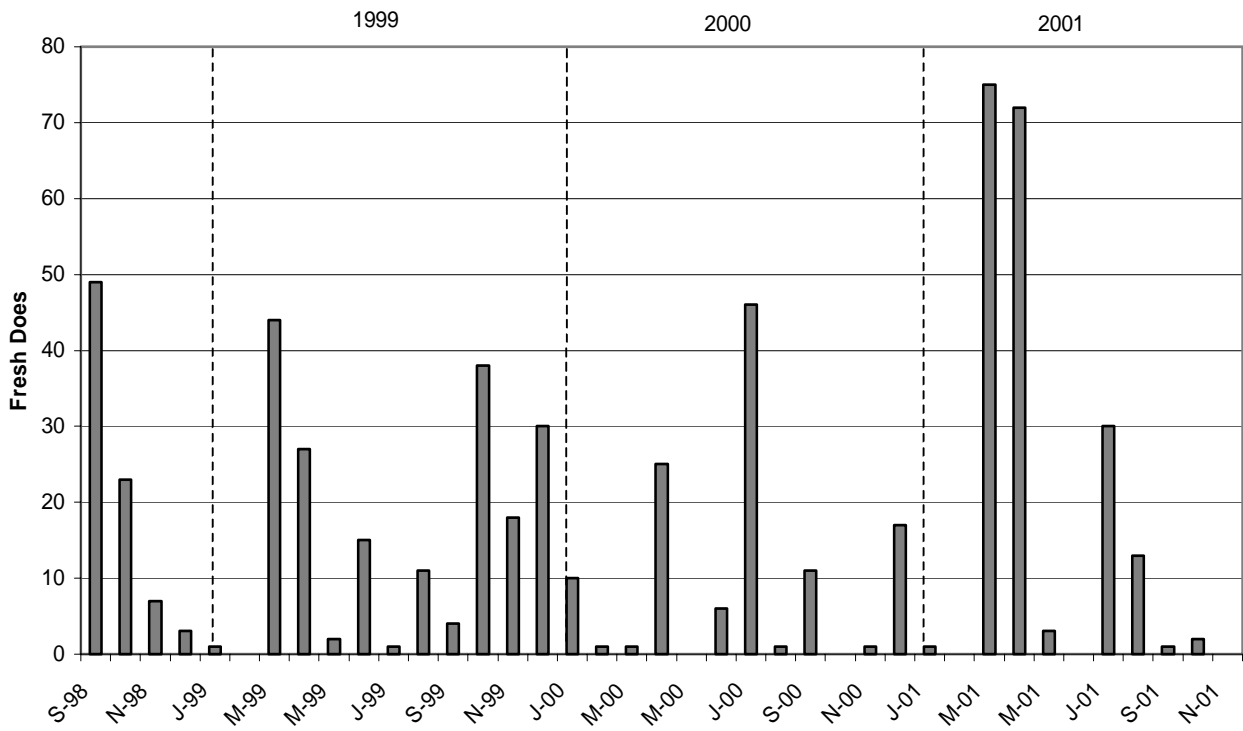


Fig 2 Doe Weight Range - Oct '98

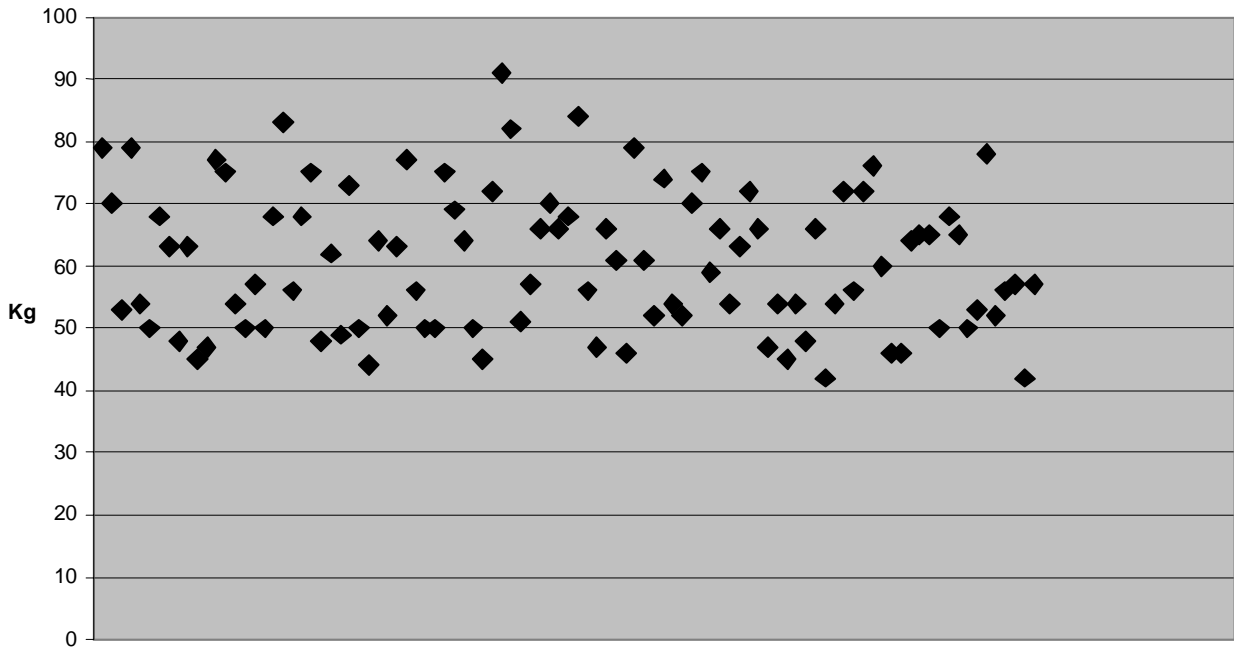


Fig 3 Doe Weights & Condition Scores - Oct '98 to Sep '99

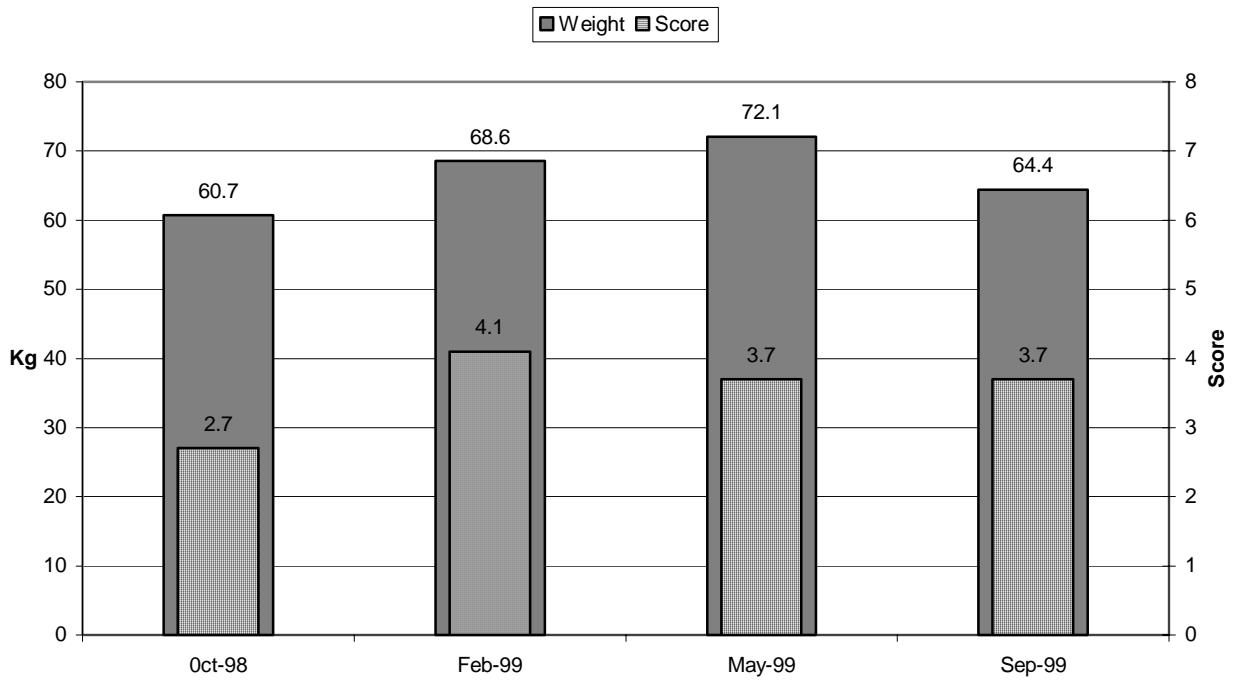


Fig 4 Spring 1998 Kids - Birth to 10 Week Weight

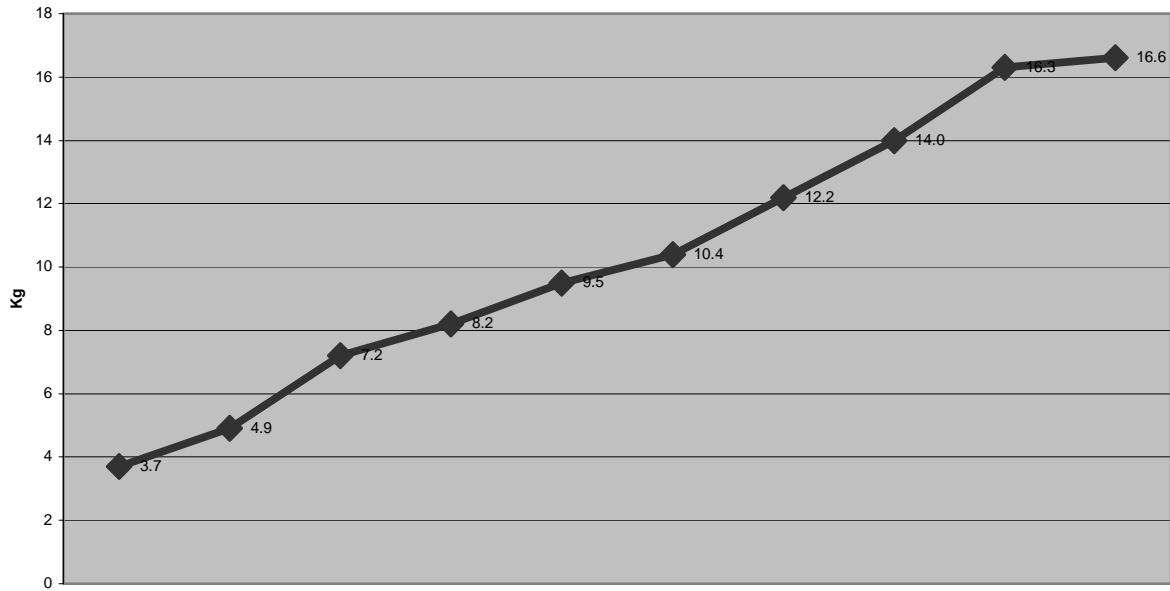
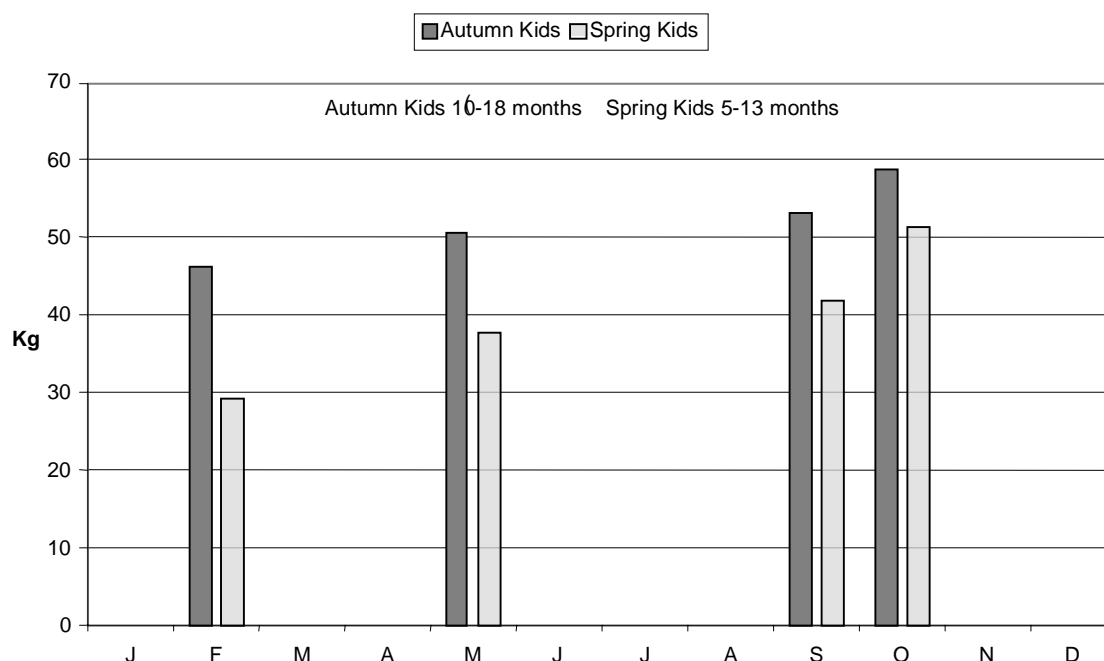


Fig 5 1998 Autumn & Spring Kids Weights - 1999



Production

The farm has produced a little more than 120,000 litres of milk annually through 1999-2000, averaging 730 litres per doe, with a composition ranging between 2.8-3.6% protein and 3.2-5.2% butterfat. Records were kept of volume and composition for each factory delivery for a 30 month period from December, 1998. Fig. 6 shows the monthly peaks and troughs of production and doe numbers for the period and highlights the shift of the peak from late spring, 1999, to autumn, 2001. Fig. 7 shows the average daily milk, protein and fat per doe by month. Highest daily yields of more than 3 litres per doe coincide with the herd production peaks. Protein and fat percentages are inversely related to yield and the graph shows that the ideal of 3% protein and 4% fat is hard to maintain.

Herd testing was conducted monthly to measure milk, protein and fat production, and somatic cell counts. Fig. 8 shows the herd test average milk yield, protein and fat percentage per doe for each test over a three year period from spring, 1998. These results are not dissimilar to the total herd picture as shown in Fig. 7. Differences are due to test day figures as compared to monthly averages for the total herd. Examination of herd test records revealed average daily milk yields per doe of 2.3, 2.6, 2.5 and 2.5 litres for 1st, 2nd, 3rd lactation and mature does respectively. The somatic cell count average per test generally exceeded 1,000,000 cells/ml, which is considerably higher than the accepted level for dairy cows but not uncommon in dairy goats (see Dairy Goat Note 4.4).

Milk produced was self delivered, mostly to a local cheese factory for the manufacture of several types of cheese, including fresh chevre, white mould and mature styles. Average price received was about 70 cents/litre. Supplies were sent to several other factories on occasions in peak periods when production exceeded demand by the local factory. The effect of protein and fat composition of milk on cheese yields was monitored for a nine month period and the strong relationship is shown in

Fig. 9.

Fig 6 Monthly Milk Production

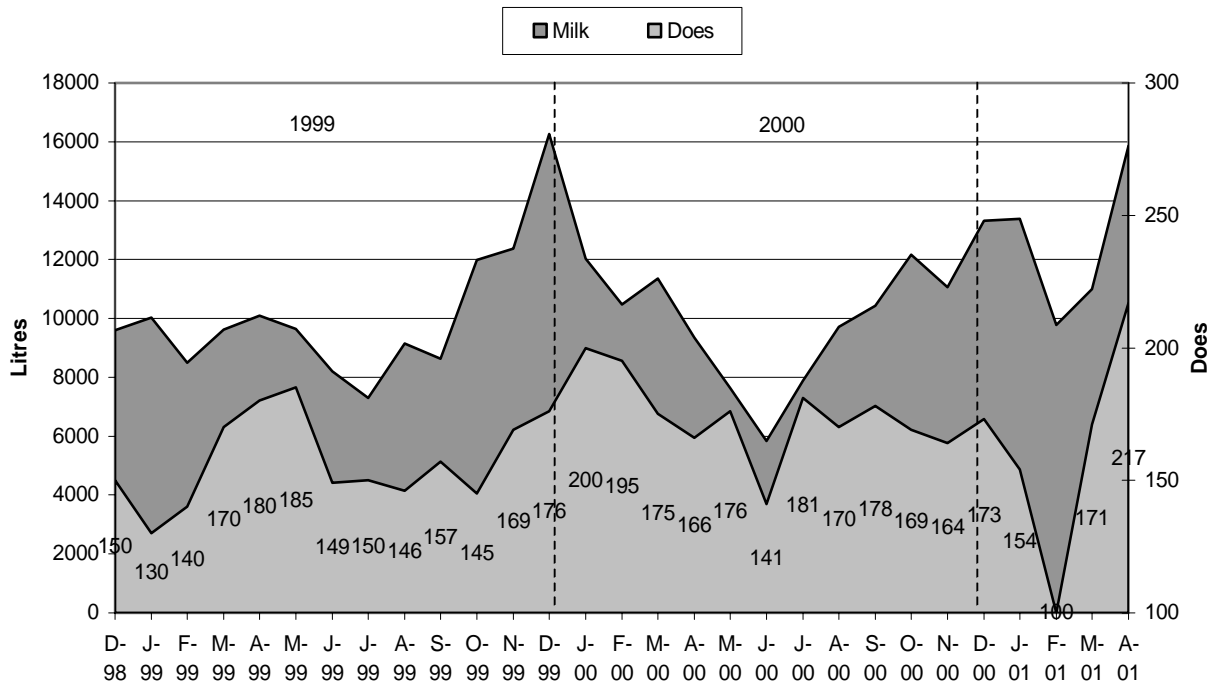


Fig 7 Average Daily Milk, Protein & Fat % by Month

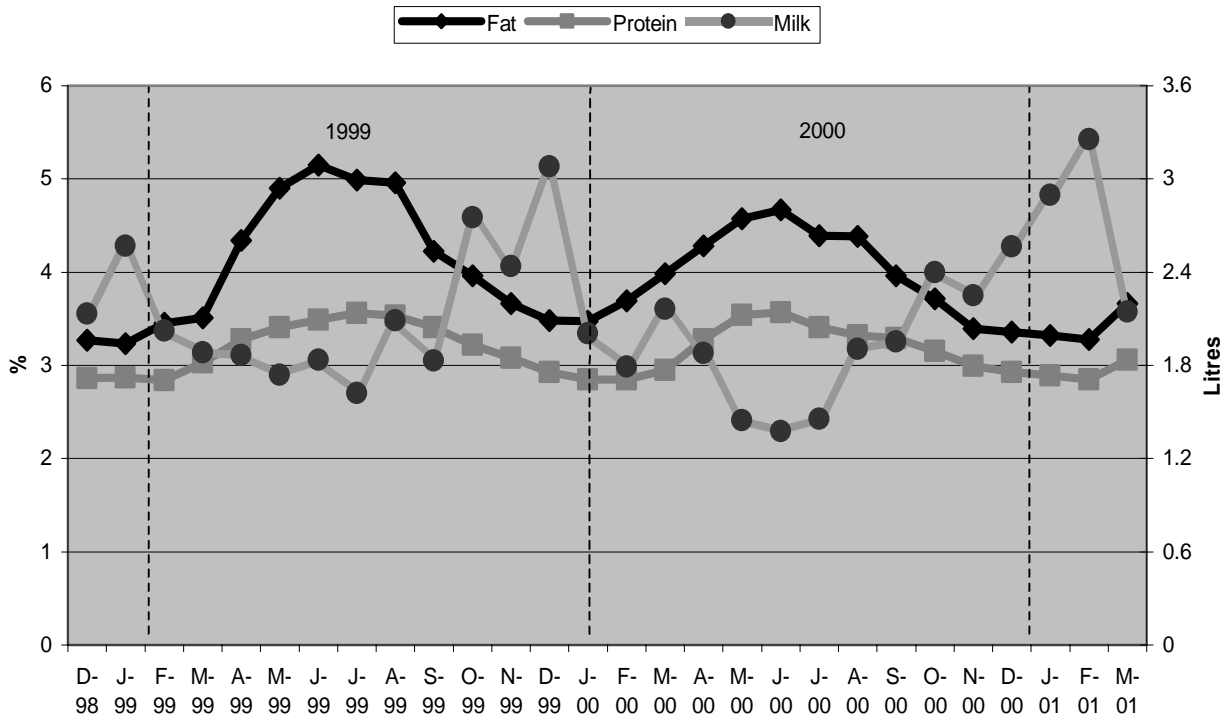


Fig 8 Herd Test Average Milk, Protein & Fat %

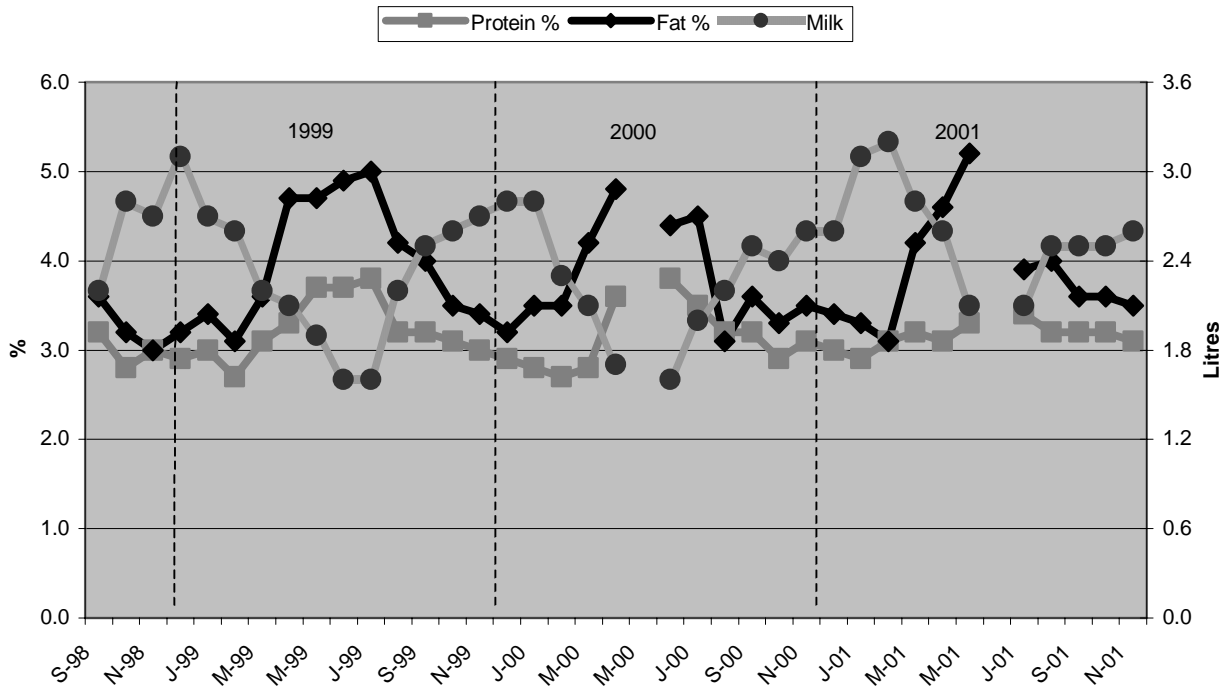
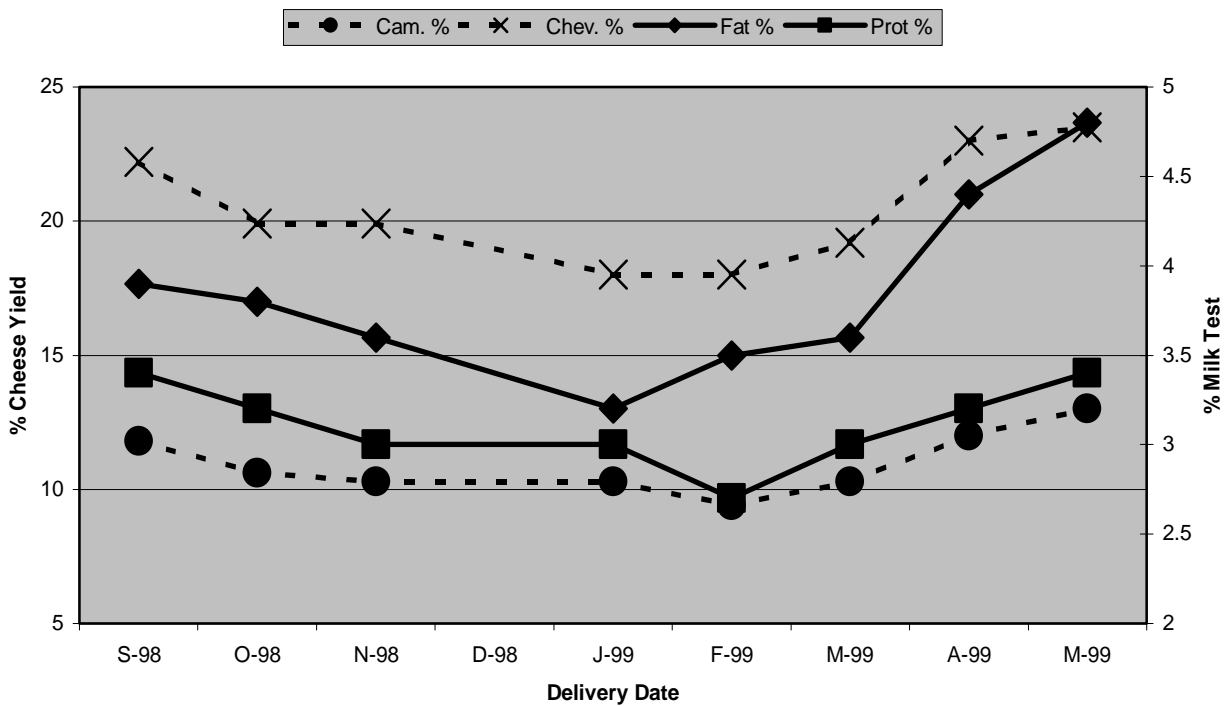


Fig 9 Cheese Yields & Milk Tests



Feeding

The feeding objective was to maintain a maximum component of high quality pasture in the diet for low cost production and optimum use of the farm area. This was achieved by maximising pasture growth and utilisation through a combination of adequate fertiliser, including nitrogen, and strip grazing with electric fencing, moving fences several times daily as required. Through most of the year this resulted in an intake of pasture which supplied about 70 % of feed needs. During dry months feeding was supplemented with silage and forage turnips and hay was fed if necessary at other feed shortages.

Bail feeding with a grain mix was maintained as a supplement through the year to ensure energy and mineral requirements. Typical components included about 50% triticale with equal portions of lupins, canola and maize plus digestive additives.

Attempts were made to calculate feed intake from the various sources, including feed analyses according to energy and protein levels, and relate this to milk production, however insufficient data and other variables prevented any conclusive results.

Involvement in a dairyfarmer discussion group (Target 10) and consultation with an agricultural advisor assisted with feed planning decisions.

Kids were reared on a feed mix of lupins, maize, canola, lucerne chaff, soya meal, sodium bicarbonate, Fermaphos and Rumensin, plus powdered cow milk, or goat milk when available, followed by ad lib grazing and hay from weaning.

Animal Health

Disease control and eradication were high priorities on this farm. 3 in 1 vaccinations (for pulpy kidney, tetanus and cheesy gland) were given twice a year to all adult and growing stock. Faecal egg counts were monitored regularly to check for presence of brown stomach and intestinal round worms. Low to moderate levels of nematode parasite infestation were the norm, achieved by strategic applications of anthelmintic drenches or applications, and slow release capsules, or their equivalent, for control of worm larvae (Fig. 10 & Table 1). A daily low dose of albendazole, given to milking does in the bail, replaced the slow release capsules which were relatively costly and difficult to administer. Low levels of nematode parasites were aimed for to decrease susceptibility to Yersiniosis which has been a problem on this property.

Fig 10 Faecal Egg Counts & Drenches - Milkers

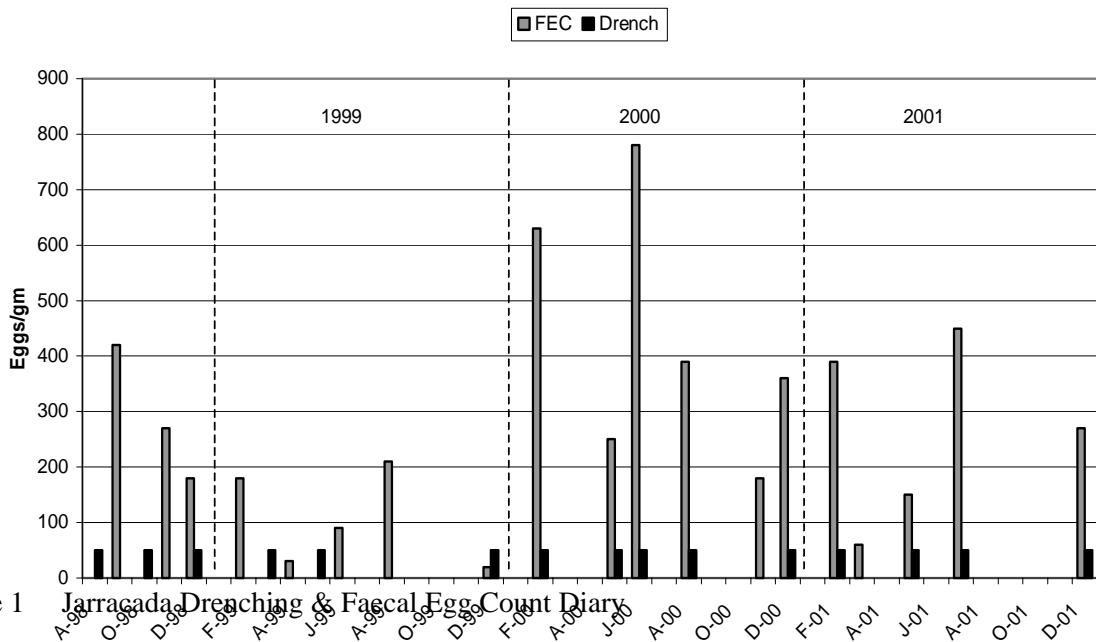


Table 1

Jarragada Drenching & Faecal Egg Count Diary

Date	Event	Strongyle	Nematodirus	Comment
25-Aug-98	<i>Extender capsules</i>			
27-Sep-98		420	120	Moderate
9-Oct-98	<i>Cydectin Pour-on</i>			
17-Nov-98		270		Mod.
5-Dec-98		180	60	Low-mod.
6-Dec-98	<i>Cydectin Pour-on</i>			
12-Dec-98	<i>Extender capsules</i>			
15-Dec-98		Zero		
14-Feb-99		180	60	Low-mod.
18-Mar-99	<i>Cydectin Oral + Valbazen daily to replace Extender capsules</i>			
14-Apr-99		30		Low
6-May-99	<i>Cydectin Pour-on</i>			
28-Jun-99		90	60	Low
2-Aug-99		210	60	Low-mod
1-Dec-99	<i>Cydectin Oral</i>			
4-Dec-99		Zero		Low
8-Feb-00		630		High
11-Feb-00	<i>Cydectin Oral - 17ml</i>			
9-May-00		250		Low-mod.
11-May-00	<i>Cydectin Oral</i>			
20-Jun-00		780		High
23-Jun-00	<i>Cydectin Oral</i>			
19-Aug-00	<i>Cydectin Oral</i>			
20-Aug-00		390		Mod.
1-Nov-00		180		Low-mod
3-Dec-00		360		Mod.
13-Dec-00	<i>Cydectin Oral</i>			
15-Feb-01		390		Mod.
4-Mar-01	<i>Cydectin Oral</i>			
15-Mar-01		60		Low
3-May-01		150		Low
19-May-01	<i>Cydectin</i>			
20-Jul-01		450		Mod.
21-Jul-01	<i>Cydectin - 20ml</i>			
6-Dec-01		270		Low-mod.
7-Dec-01	<i>Cydectin - 20ml</i>			

Other preventative health treatments included regular use of a zinc sulphate footmat, routine hoof trimming, and vaccinations as required. A diary of health problems and medical treatments was maintained and Table 2 gives a summary of matters attended to during one full year.

Table 2: Incidence of Health and Injury Problems – 1999

Health or Injury Problem	No. of Cases
Yersiniosis	34
Scouring (no specific diagnosis)	21
Mastitis	7
Bloat (abomasal in milk fed kids)	6
Foot Problems	13
Injury	4
Metritis	2
Other	7

North West Tasmania – Michael & Stacey Rocca, “Anroc”, Gunns Plains

Property Overview & Aims

“Anroc” is in the Leven River valley on the steeply sloping west bank, with annual rainfall of 800mm. It was a cow dairy farm on 30 hectares that had been “let go” to weeds, bracken and bush regrowth before Michael & Stacey Rocca bought it in 1995 with the intention of converting it to a dairy goat farm. They saw the potential of the red loam soils and climate, and had been impressed with the opportunities from dairy goats, grazed like cows, but needing much less land to run a viable herd. Improved pastures of perennial ryegrass, cocksfoot, white and red clover were sown and liberally fertilised with super and potash. The area under quality pasture totalled 20 hectares, which was economically sub-divided with electric fencing into 23 paddocks (mostly ½ hectare). Paddocks were strip grazed by the dairy herd.

Aims at “Anroc” were to:

- Milk between 400-500 does within the next few years.
- Improve most of the remaining 10 hectares to maximise feed production potential of the property
- Continue to base production on high stocking rates, rotational grazing and high pasture utilisation (>70%) through feed budgeting, using as little bought in feed as possible.
- Obtain production of 600 litres per doe pending the introduction of AI and improved genetics into the dairy goat population.
- Maximise average protein and butterfat content of milk through herd test monitoring and appropriate feeding.
- Continue with a minimal approach to worm control, drenching on an “as needs” basis via regular egg count monitoring.

The vision on this farm was “to have a high producing dairy goat farm that returns consistently high profits to provide for the needs of the family”.

(Note: The farm was sold in 2001 due to Rocca family commitments interstate)

Herd

10 goats were milked in the converted cow dairy in the first year as work commenced on fencing, clearing and sowing high quality pasture. Goat numbers in the predominantly Saanen herd gradually climbed, through purchases and breeding, and as pastures developed, to 40 in 97/98, 130 in 98/99, 200 in 99/00, the first year of the project, and 260 in the last year of the project. More than half of the milking does were in their first two lactations. The dairy was upgraded to a 16 unit, double-sided swingover in 2000.

Breeding objectives were to increase milk production, protein and fat test, consistent with payment formulae, and to improve dam vigour through selection. Bucks were run with the herd from March until drying off, usually in April/May.

Kidding occurred mainly in September until later years when there was a shift back to August. Target weaning weights and ages were 15kg and 10 weeks. Maiden does were joined at 7 months at about 35kg, to kid at 12 months.

Weighing and condition scoring were attempted on this farm but little data were collected.

Production

Total milk production increased in the four years since 1997/98 from 18,000 to about 110,000 litres as herd size grew more than five-fold. Yield per doe averaged about 450 litres, falling off a little in later seasons due to dry conditions. Seasonal production during the two years of the project followed the typical pattern of spring peaks and tailing off in summer before a slight lift with supplementary feeding and autumn rains (Fig 1). Weekly milk production and fat test for most of 2000/01 is shown in Fig 2 and reveals again the inverse relationship between milk yield and fat test.

Milk was collected by cheese factories in Launceston, primarily engaged in manufacture of fresh chevre type cheeses. Prices received were initially about 75 cents/litre, but from 1998 all production was supplied under contract at an average price of 90 cents per litre. A premium was received if butterfat content exceeded 3.8%

Fig. 1

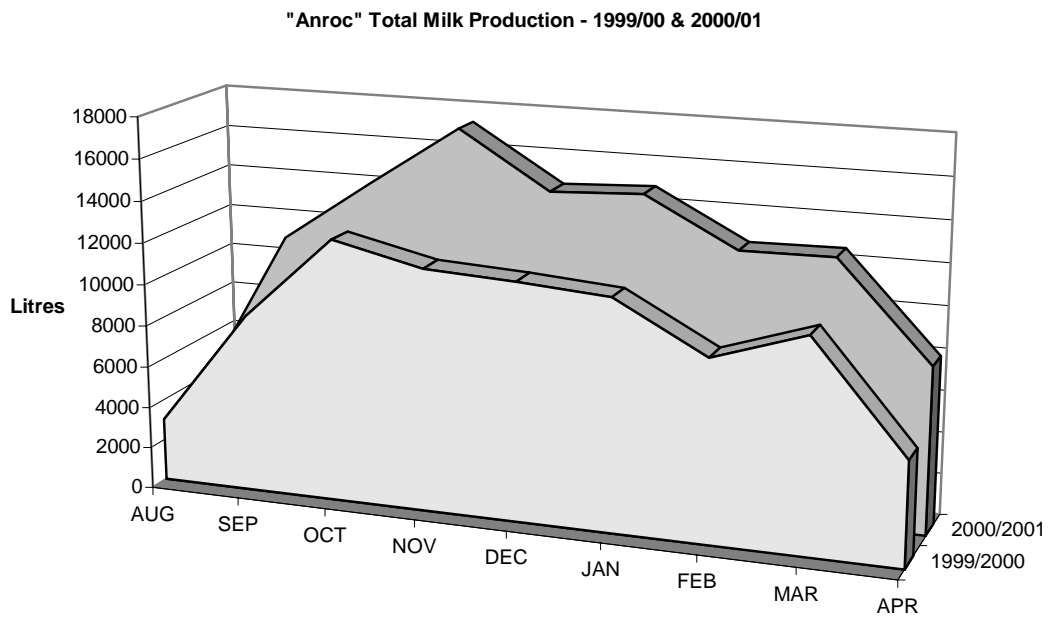
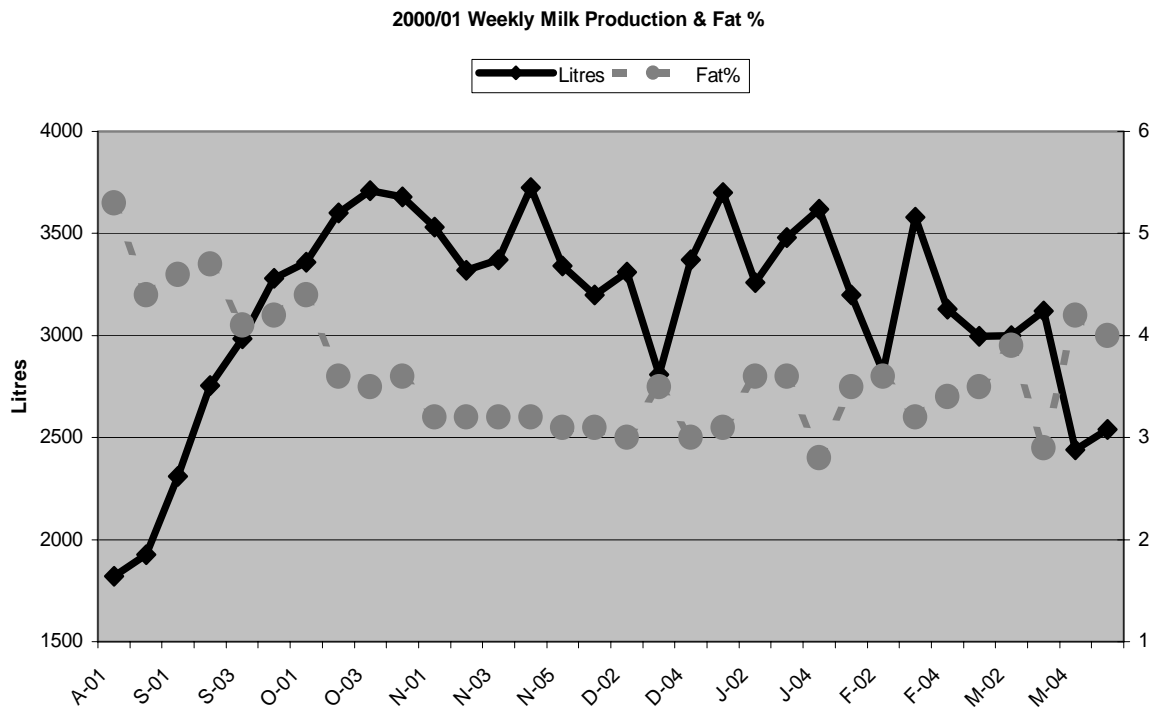


Fig. 2



Herd testing was conducted 2-3 times per season to monitor high and low producers. Table 1 summarises the results of the tests completed and the difference in yields according to age of does. Average somatic cell count in this herd was steady at about 500, less than half that for the Gippsland farm. The range of production per doe after 200 days of lactation is shown in Table 2 and clearly illustrates the value of herd testing for detecting high and low producers. Composition is given in Fig.3.

Table 1

Test Day Summaries

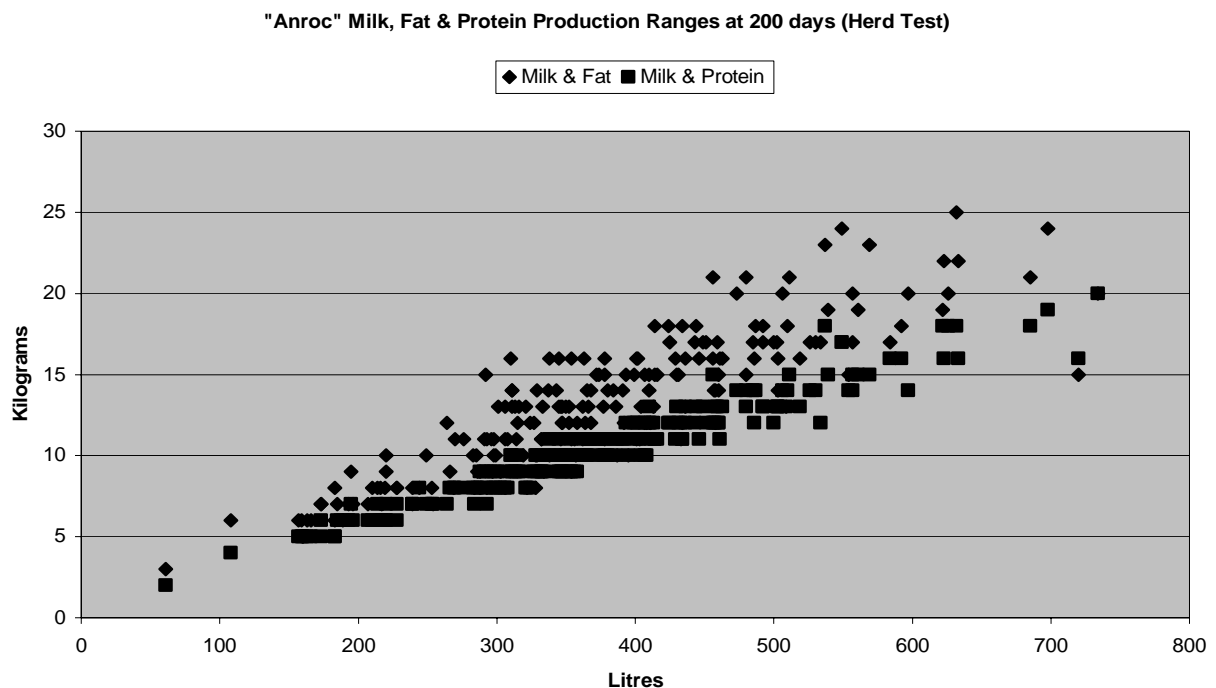
	Nov '99	Jan '00	Mar '00	Oct '00
Does Tested	197	203	200	258
Litres	2.1	1.9	1.9	2.1
Protein kg	.06	.05	.06	.06
Protein %	2.7	2.7	3.0	2.9
Fat kg	.07	.07	.07	.08
Fat %	3.3	3.7	3.7	3.5
Cell Count	457	546	484	424

Table 2

Lactation Production to March '00 (~ 200 days)

	Does	Milk l.	Prot kg	Prot %	Fat kg	Fat %
Herd	203	375	10	2.7	13	3.5
Mature	118	411	11	2.7	14	3.4
2YO	31	386	11	2.9	14	3.6
1YO	54	291	8	2.8	10	3.4

Fig. 3



Feeding

The feeding objective on this farm was also to maximise the intake of pasture for all classes of stock, throughout the year, and feed budgeting (Table 3) was conducted with the help of an agricultural advisor and attending dairy discussion groups. Strip grazing was practised in the small paddocks by electric fencing and pasture consumed was regularly measured with a pasture meter. Dry summers during the two seasons necessitated more brought in fodder and bail feeding than anticipated, plus a little agistment, but the pasture component of the diet was still maintained at about 70 %. The aim was not to cut silage or hay on the farm, but rather to fully stock.

Feed inputs and costs for the bulk of the lactation in two consecutive years are given in Table 3 and show total feed costs per litre of 12.2 – 13.5 cents, less than half that of the average dairy goat farm surveyed.

Kids were reared mainly on cow milk replacer for the first 8 weeks, plus starter pellets and hay which then became the main feed components prior to weaning onto pasture from about 10-12 weeks of age.

Table 3

1999/2000(October 1 – March 31)

Feed	Rate <i>kg/doe/day</i>	Total Fed <i>kg DM</i>	Unit Cost <i>cents/kg DM</i>	Total Cost \$
<i>Pellets</i>	0.3 (early lactation)	3,660	27	988
<i>Triticale</i>	0.8 (after pellets)	14,520	22	3,194
<i>Silage</i>	1.0 (early summer)	2,000	14	280
<i>Agistment</i>	1.5 (late summer)	12,600	5	630
<i>Pasture</i>	1.6 (average)	58,220	5	2,911
<i>Totals</i>		91,000		8,003

2000/2001(August 1 – April 12)

Feed	Rate <i>kg/doe/day</i>	Total Fed <i>kg DM</i>	Unit Cost <i>cents/kg DM</i>	Total Cost \$
<i>Pellets</i>	0.2-0.8 (mostly summer-autumn)	28710	30	8,125
<i>Lucerne Hay</i>	0.7 (summer)	5,000	19	950
<i>Pasture</i>	0.5-2.0	90,000	6	5,400
<i>Totals</i>		123,710		14,475

Production Cost for Feed

	Milk Produced for period Litres	Feed Bill \$	Cost/Litre cents
1999/2000	65,595	8,003	12.2
2000/2001	107,000	14,475	13.5

Table 4

"ANROC" DAIRY GOAT FARM FEED BUDGET: April 21 - October 14, 2000													
EFFECTIVE AREA (ha)	1978												
	20	20	20	20	20	20	20	20	20	20	20	20	20
INITIAL COVER:													
PERIOD:	21-Apr	7-May	23-May	8-Jun	24-Jun	10-Jul	26-Jul	11-Aug	27-Aug	12-Sep	28-Sep	14-Oct	
Growth rate/Day (kgDM/ha/day)	15	20	25	20	15	12	5	5	15	25	30	45	
Intake required/day (kgDM/ha/day)	31	31	31	21	21	21	24	33	31	34	35	37	
Pasture surplus / deficit	-16	-1	-6	-1	-8	-9	-19	-28	-16	-9	-5	8	
Feed surplus / deficit (incl. supplements)	-3	5	9	10	2	-1	-10	-18	-8	-1	3	17	
Supplements (Total kgDM/period)													
Slage (Harvested)												0	
Slage (Feed Out)												0	
Hay (Harvested)												0	
Hay (Feed Out)												8,208	
Grain (Does)	3840	3840	1920	2032	2032	2032	1232	592	192	96	2592	2784	
Grain (Kids)	432	432	432	432	432	432	432	432	432	192	96	22,176	
Nitrogen:	1000	1000	2600	1000	1000	1000	1000	1000	1000	1000	1000	4,176	
TOTAL	4272	6272	4,852	3,464	2,464	2,464	2,624	2,944	2,544	2,688	2,888	2,784	
FINAL COVER (without supplements)	1,720	1,541	1,443	1,424	1,326	1,180	881	439	180	34	-52	84	
TARGET COVER	1,933	2,018	2,168	2,322	2,347	2,324	2,167	1,862	1,730	1,718	1,767	2,042	
FINAL COVER (with supplements)	1,933	2,018	2,168	2,322	2,347	2,324	2,167	1,862	1,730	1,718	1,767	2,042	
ANIMAL INTAKE													
Milking goats (number)	200	200	200	200	200	200	100	200	200	250	270	290	
Intake/Head/Day	2.5	2.5	2.5	2.5	2.5	2.5	2	2.5	2.5	2.5	2.5	2.5	
Dry goats (number)	90	90	90	90	90	90	90	90	90	40	20	20	
Intake/Head/Day	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	
Kids	6	6	6	6	6	6	6	6	6	6	6	6	
Intake/Head/Day	1	1	1	1	1	1	1	1	1	1	1	1	
Bucks	31	31	31	21	21	21	24	33	31	34	35	37	
Intake/Head/Day	498	498	498	338	338	338	378	522	498	546	588	585	
TOTAL DEMAND/DAY	498	498	498	338	338	338	378	522	498	546	588	585	
DAYS/PERIOD:	16	16	16	16	16	16	16	16	16	16	16	16	
TOTAL PASTURE GROWN	240	320	400	320	240	192	80	80	240	400	480	720	
TOTALS													

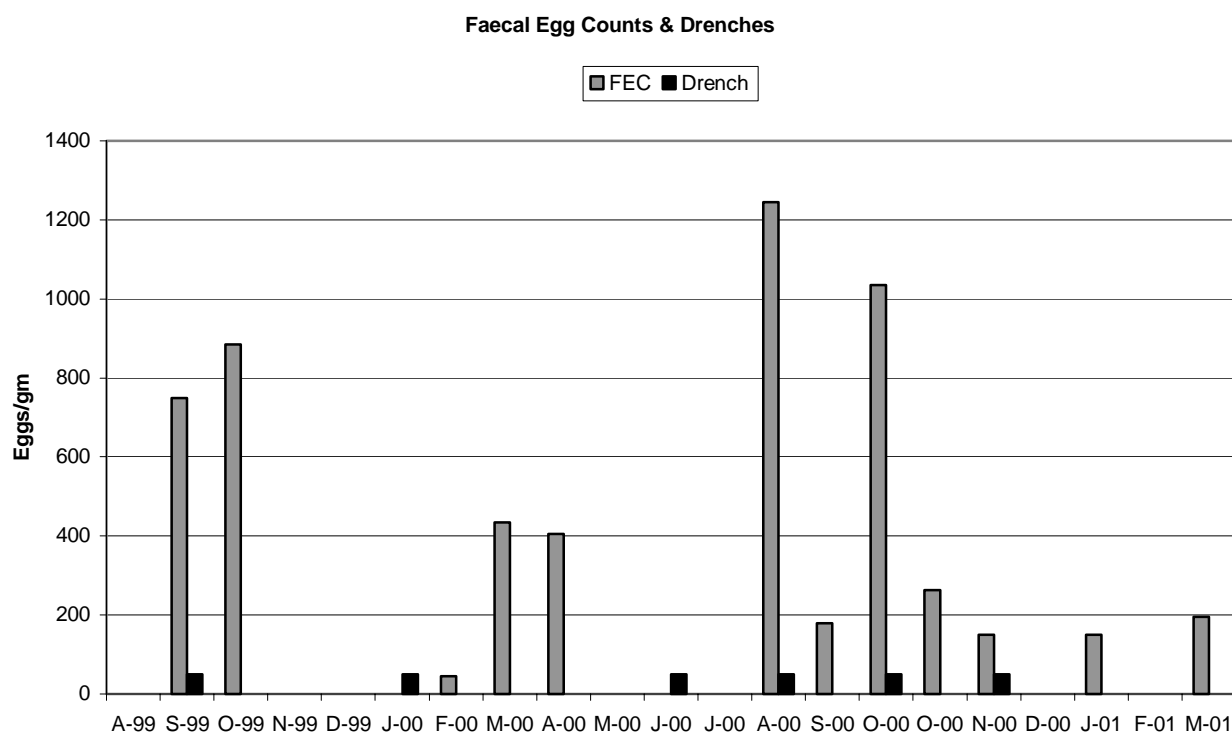
Animal Health

A disease management program was implemented with routine vaccinations of 5 in 1 and early observation of abnormalities. The nematode parasite control policy at “Anroc” was based on regular monitoring of faecal egg counts, plus occasional monitoring of drench effectiveness. This was followed by strategic drenching, as required, using the most effective broad-spectrum treatments, consistent with minimising residues and development of drench resistance. Table 4 and Fig 4 show the testing and drenching regime practised. Moderate levels of infestation have occurred but do not appear to have been detrimental to doe condition and production, possibly due to good nutrition. Zinc sulphate footbaths were used prior to the onset of warm, wet weather.

Table 5

Date	Stock	Drench	Egg Count	Comments
Sept 23, 1999	Milkers		750	Moderate
<i>Sept 28</i>	<i>Milkers</i>	<i>Ivomec Pour-on – 7.5ml</i>		
Oct 8	Milkers		885	Moderate
Jan 6, 2000	Kids		585	Moderate
<i>Jan 7</i>	<i>Kids</i>	<i>Nilverm – 2 x 7.5ml, 1 hour apart</i>		
Jan 18	Kids		45	Low
<i>Jan 25</i>	<i>Milkers</i>	<i>Nilverm – 2 x 20ml, 1 hour apart</i>		
Feb 9	Milkers		45	Low
Mar 9	Milkers		435	Light-Moderate
Mar 9	Kids		900	Moderate
<i>Mar 22</i>	<i>Kids</i>	<i>Nilverm – 2 x 10ml, 1 hour apart</i>		
Apr 6	Milkers		405	Light-Moderate
<i>June 13-19</i>		<i>All adult does and goatlings drenched</i>		
Aug 29	Milkers		1245	High
<i>Aug 29</i>	<i>Milkers</i>	<i>Cysectin Oral – 15 ml</i>		
Sep 21	Milkers		180	Low
Oct 20	Milkers		1035	High
Oct 25	Milkers	(Drenchrith test)	264	Light
<i>Nov 15</i>	<i>Kids</i>	<i>“2 up” Combination – 5 ml</i>		
<i>Nov 16</i>	<i>Milkers</i>	<i>“2 up” Combination – 17ml</i>		
Nov 28	Milkers		150	Low
<i>Dec 28</i>	<i>Kids</i>	<i>“2 up” Combination – 5 ml</i>		
Jan 17, 2001	Milkers		150	Low
Jan 23	Kids		15	Low
Mar 20	Milkers		195	Low
Mar 29	Kids		30	Low

Fig. 4



Observations & Conclusions

- Both farms have demonstrated that dairy goats can be farmed similarly to cows, with most feed being obtained by grazing pasture, the cheapest feed input.
- Neither farm shedded goats have shown that exposure to weather whilst grazing, contrary to some beliefs, has little adverse effect on production or goat health.
- Goats' grazing habits and palatability preferences appear to preclude the intensive, close grazing possible with dairy cows, but not efficient pasture utilisation through strip grazing.
- Different production levels at the two farms may reflect the relative length of time spent in building and culling the herds more than any other factor.
- The degree of tolerance of nematode parasite infestation is markedly different between the farms, partly due to concern about predisposition to Yersiniosis at Jarracada. Time will tell whether the moderate levels at Anroc can be sustained.
- Somatic cell count levels also differ considerably between the farms, being surprisingly low at Anroc. The explanation for this contrast is unclear.
- The different kidding and production patterns reflect their cheesemakers' requirements; Jarracada attempting an even year round supply, and Anroc a seasonal supply.
- It is significant that both farmers found great value in attending dairy cow discussion groups and used agricultural advisors from time to time.

Recommendations

- The industry should foster the concept of Focus Farms, strategically located in different climatic regions, to allow monitoring and demonstration of management practices to surrounding dairy goat farmers.
- In addition, dairy goat farmers should be encouraged to associate with dairy cow farmers in discussion groups and at field days to examine the principles behind dairy cow management, eg, feeding and herd improvement, which have relevance.

- The project has revealed that, whilst there are close similarities between farming dairy goats and cows, considerably more work is needed, perhaps in a more controlled situation, to define the relationships between feed intake, growth and milk production.
- Nematode parasite control appears to be a particular management problem with dairy goats and has tended to promote relatively expensive husbandry methods. More research is needed into anthelmintic and other worm control methods.
- Dairy goats generally have much higher levels of somatic cell count than the accepted dairy cow standards, yet there is evidence that yield and quality of manufactured goat milk products can be adversely affected. More precise data are needed to give farmers targets to aim for.
- Genetic improvement in dairy goats lags well behind that of dairy cows. Despite the relatively small size of the industry, genetic principles should be extended, organised herd testing recommended for all, and co-operative breeding schemes promoted.

Computerised Recording

Introduction & Aims

Apart from the endeavour to provide Focus Farms with computerised recording systems for ease of monitoring and collating data, an objective of the project was to produce dairy goat farm management data recording and reporting software for use on personal computers.

It was expected at the outset that, either modification of currently available software packages for dairy cow farms, eg, “PC Farm”, or adaptation of programs from other countries with dairy goat industries would suit the requirement.

“PC Farm” and “Mistro”, two Australian programs designed for dairy cow farms, were evaluated on the Focus Farms. Both were found to be of limited use, even for herd test monitoring, due to different parameters used for dairy cows and containing breeding modules that had no current application to dairy goat farming. Several other dairy cow based programs in Australia and New Zealand were examined but had the same shortcomings.

During the Study Tour to France, the opportunity was taken to investigate programs relevant to dairy goat farming as used in other countries. Whilst there were several that dealt with components of farm management, eg, feeding or breeding, there was no evidence of any complete farm management programs.

In view of the apparent lack of suitable dairy goat herd management programs, either locally or from overseas, and the dubious cost effectiveness of converting dairy cow programs, it was decided to develop a database program using Microsoft Access as the platform.

Arrangements were made and specifications drawn up with Wemer Osewald, a professional computer programmer involved in dairy goat farming with his wife at Culcairn, NSW, to develop modules for a dairy goat farm. These were progressively constructed and tested by the project investigators, with the help of two other dairy goat farmers and an agricultural advisor.

Results & Specifications

A pilot version of a dairy goat farm computer program, entitled “Capri”, has been produced for operation with a Microsoft Access 2000 database. Computer capacity required to successfully run the program is 64 MB of RAM and 20 MB of Hard Disk Drive, together with installation of Microsoft Access 2000. Further refinements to the program are intended in conjunction with the Computer Sciences Department at Latrobe University.

The program is designed to allow easy data entry, querying and reporting through prepared Forms, Tables and Reports, directly applicable to the needs of commercial dairy goat farms. However, the

facility is available through the Access system for users to customise most aspects of data handling, if desired.

Modules for data entry and analysis include categories covering Farm, Herd, Animal, Paddock and Feed details. A brief outline of data types within these categories is:

- Farm – identification, description and contact data.
- Herd – production, sales, income and herd treatments such as drenching and faecal egg counts.
- Animal – for does, kids and bucks, including identification, lactation (herd test), breeding, health events, weights, scores, and traits.
- Paddock – area, description, pasture or crop type, irrigation, management and grazing details
- Feed – type, quantity, quality, stock fed and feeding period

In addition, pre-designed queries and reports are available including:

- Herd & Herd Group Production - daily to annually
- Doe Production – by herd test period and lactation
- Feed Inputs & Feed Budgets
- Growth Rates
- Fertility Rates
- Buck Evaluation
- Health & Veterinary Treatments Schedule

Recommendation

The Program is currently very much a pilot version and despite numerous improvements during its development there will be many features that can be added to make it more user friendly and suitable. The industry should attempt to co-ordinate further development to ensure the program remains applicable to commercial dairy goat farms and to have it used as widely as possible.

Technical Information

Introduction & Aims

In view of the lack of up to date technical information specifically relevant to dairy goat farming, as distinct from fibre or meat goat farming, an important component of this and the preceding project was to produce a manual of reference notes on a range of technical subjects. This was attempted by initially examining as many pertinent Australian and overseas publications as possible, eg, manuals, conference articles and seminar proceedings, then drafting a series of “Dairy Goat Notes” in consultation with a number of professional advisors and industry people.

Manual Summary

The resulting “Dairy Goat Notes” Manual has been published separately (RIRDC Publication No. 02/025). It does not attempt to address every possible aspect of, or approach to, dairy goat farming, but concentrate on information of widest interest and application. Sections and subjects covered include:

- Farm & General
 - industry and markets
 - farm location and layout
 - breeds available
 - annual check list
- Milking Management
 - dairy shed and machines
 - milking hygiene
 - milk quality requirements

- Herd Management
 - feeding and nutrition
 - grazing management
 - mating management
 - herd improvement
 - condition scoring and weight monitoring
 - kid rearing
- Health
 - parasite control
 - mastitis control
 - foot problems
 - other diseases

Recommendation

The Manual was designed as a loose leaf publication to enable easy updating from time to time. This should be conducted on a regular time scale, perhaps every five years, by an industry nominee with appropriate funding sought for the task.

Farm Surveys

Introduction & Aims

From 1997, during the first phase of the project, an annual survey of commercial dairy goat farms was conducted to collect statistics and data on farm details, herd and goat numbers, production, management practices and future intentions. The surveys were modelled on those in use by the Victorian dairy cow industry.

The objectives were to establish a regular industry monitoring system from which farmers would gain by inter-farm performance comparisons, cheese manufacturers would be able to plan more positively from farm predictions, and the industry would benefit from improvements in productivity, accruing from establishment and periodical review of industry benchmarks.

All farmers who responded to the survey received their own confidential report, comparing their farm performance with others. A full survey report, aggregating all responses and masking individual identities, was also produced for industry information, to provide data on benchmarks, predictions and trends.

Three surveys were completed successfully, in 1997, 1998 and 1999. A fourth survey was attempted in 2000 but was hampered by a low response rate due to a similar survey having been conducted at the same time through another project collecting data from the dairy goat industry. Questionnaire content was kept fairly uniform from year to year to monitor trends, but special topics were surveyed on occasions.

An average of 21 farmers responded each year to the three surveys, an average response rate of 47% of those contacted. Responses were distributed across the five southern and eastern States in close proportion to the spread of commercial farms.

Summary of Surveys

A summary of each survey is provided in Appendix I, together with a copy of a survey questionnaire and the Farmer Report. A combined summary of the three surveys follows:

Farm Details

The goat dairying area on farms varied considerably in size, not necessarily connected with goat numbers, and averaged 36 hectares in the final survey. Most respondents used the dairying area mainly

for grazing whilst a small number had goats mostly intensively housed. The majority of farms were managed and operated by between one and two persons, usually the owning family.

Nearly all dairy sheds were of the herringbone type, single sided or doubled up, with 6 to 12 sets of cups a usual number, except for a few large sheds. Peak season throughput averaged about 60 does per hour, however this varied greatly with herd size, from 15 to 250 does per hour. Increasing the size of dairy sheds was on the agenda of many farmers, consistent with plans to boost stock numbers.

Milk was usually stored in cooled vats of sufficient size to cope with up to a week's production. Self delivery in food grade plastic containers, twice a week, was the most common method of milk transport to factories.

Stock

The number of milking does run on the dairying area of farms ranged from 17 to 460 in the last survey, indicating the great diversity in dairy goat farming. Most farms surveyed now have more than 100 does, however the average is still less than half that considered appropriate for a truly viable enterprise. Almost every farm planned to increase herd numbers in the immediate future with forecasts ranging up to 500 does, however these plans may be tempered by current industry fortunes.

Kidding usually occurs in early spring, consistent with the natural breeding behaviour of goats, however this leads to a seasonal imbalance in supply to the concern of most cheese manufacturers. A number of farmers are now projecting a spread of kidding through the year or even of concentrating on an autumn kidding period. Most farms are self contained with kids, goatlings and bucks all run on the dairying area. Stocking rates as high as 10 does per hectare are being achieved on the more intensively grazed farms.

Feeding

Most farms rely heavily on brought in feed to supplement pasture, crops or fodder grown on the farm. Grain and pellets, and to a lesser extent hay, are the usual brought in feeds and amounts fed per animal have increased steadily since the first survey year. Cost of brought in feed averaged 13 cents per litre (on an adjusted grain equivalent basis) in the last survey year, but has ranged up to 35 cents per litre. These levels can be accommodated at present milk prices but leave plenty of room for improvements in profitability, as has been demonstrated on some farms maximising pasture feed.

Production

Average production per milking doe has been about 500 litres but has ranged from 170 to 968 litres, again indicating the huge variation in dairy goat farm management, and the potential that can be achieved. Herd improvement techniques such as herd testing and artificial breeding are employed by a minority of respondents but, due to the lack of a co-ordinated scheme, are probably having little effect on production improvement at this stage.

Most milk produced is sold to factories, generally for cheese making. A small proportion of farms process their own milk for whole milk sales, yoghurt or cheese production.

Parasite Management

A survey of parasite management practices in 1999 revealed that drenching and other parasite treatments were generally applied on a routine basis, but with very little monitoring of necessity or effectiveness through faecal egg counts. Surprisingly, most farmers did not consider parasites were a problem.

Special Topics

Financial performance of dairy goat farms was surveyed in 1999 in response to industry suggestions however responses provided were too inconsistent to analyse with any confidence. Culling reasons and breeding details were sought in the incomplete 2000 survey.

Conclusions

- The dairy goat industry is a typical agricultural industry with a wide variation between farms in management practices, production levels and productivity parameters. Many farms appeared to be operating with a less than commercially viable herd size.
- Most farms were planning to increase herd size and shed capacity, but these aims will depend on product demand over time. There is generally insufficient attention being paid to achieving a more even year round supply, consistent with market needs.
- The leading farms had a low ratio of brought in feed to production level and generally had the larger herd sizes. Pasture and crop establishment, maintenance and production, and grazing management, are farming practices with considerable potential for application in dairy goat farming to improve productivity.

Recommendation

- Future industry management will rely heavily on measuring farm activities on a regular and routine basis. The industry should conduct this type of comprehensive farm survey, at least every two years, to guide future planning and provide farm benchmarks.

Market Surveys

Aims & Method

Two surveys were conducted, in 1999 and again in 2000, with the emphasis on gathering accurate market data on specialty goat cheese production, sales and imports, together with opinions of distributors and consumers.

Production data was collected by direct contact with major Australian cheese makers. Import data and supermarket sales were obtained through consultation with the Australian Dairy Corporation. In conjunction, qualitative surveys were conducted with distributors, retailers and restaurateurs. A total of 45 responses were received to the latter phase of the survey, 42 % of those contacted. Full survey reports and a sample questionnaire are provided in Appendix II.

Summary of Surveys

Cheese Production

Cheesemakers in Victoria and Tasmania processed about 1.5 million litres of milk during 1999/2000. This would have yielded approximately 250 tonnes of cheese, mostly of the fresh chevre type. Production in other States has been difficult to quantify but would probably increase the total to around 300 tonnes. A decade ago, production would have been less than a fifth of these amounts, illustrating the substantial growth in this sector. Total retail value of production now exceeds \$3.2 million.

Some cheese factories are directly supplied by farms, several have on-farm operations, and some have had all or part of their milk supply from a distribution company. Seasonality of milk supply has been addressed with varying success. An incentive is paid for winter milk by a few buyers but the true cost of out-of-season supply has not been established. However, in recent times this seasonality does not appear to translate to supply problems in the cheese marketplace.

Factories were fully supplied during the second survey creating a milk surplus in spring/summer. Some of this has been absorbed by cheesemakers, some of whom report wastage of surplus product; some has been used on-farm for kid raising and some has been discarded (estimates of 100,000 litres have been made). Efforts have been made since October, 1999, to explore export markets for cheese and other goat milk products, and to access processing (especially drying) facilities for milk.

Cheese Imports

Imports classified by Customs as goat cheese now total about 60 tonnes per annum and have grown steadily but slowly over the last decade. Average value has been about \$10 per kilogram which is around two-thirds of the value of Australian goat cheese. Considerably higher quantities of fetta and kasseri have been imported, however despite the common perception that these cheeses are made from goat or sheep milk, it appears unlikely, on the basis of price and also the lack of any specific claims made, that much goat milk is involved.

Customer Profile

Most customers were identified in the age range, students to 40 years old. They were also described as gourmet/trendy, 'diverse', upmarket/higher income, adventurous eaters, ethnic and health conscious, in approximate order. Goat cheese as such, except for some bulk fetta, is not commonly found outside the more affluent areas and health food shops generally do not stock goat cheese due to low demand.

Source of Cheese

Australian cheese was generally preferred, perhaps due to availability and familiarity, despite often being more expensive. There does not appear to have been a wide exposure by most respondents to a variety of local and imported cheeses. Chefs occasionally reported a preference for imported cheese, based on taste or the dish being prepared.

Demand

Most respondents said demand was either steady or growing. Distributors are seeing the most growth. This seems to suggest more outlets, as retail and restaurants tended to identify stable use. Restaurants and wholesalers identified a slightly higher use in warmer weather, in contrast to retailers who reported steady seasonal sales.

Preferred Types

Plain chevre is most preferred across all respondents, followed by fetta. Fetta usage is well below chevre in restaurants and delis, but sales are higher in supermarkets. Other types mentioned include hard, blue, white rind and washed rind. Expectations of taste and texture are remarkably varied, ranging from mild to strong. A smooth creamy consistency is generally considered important.

There are two styles of fetta: first the traditional Greek, where the type of milk is unspecified but assumed by outlets to be goat or sheep; and secondly the gourmet, where new product that is specifically made from goats milk is appearing, often value-added, eg, marinated. The two styles do not usually appear in the same outlets.

Preferred Packaging

Surprisingly, considering the difficulties that can be experienced opening cryovac, there have been no complaints about this. Packaging is related to the type of cheese, with traditional fetta often coming in buckets, hard cheese wheels cut to order, and softer cheeses in cryovac. Cryovac is appreciated for its ease of handling and extension of shelf life. It is disliked by a few because it doesn't allow the cheese to 'breathe' or mature naturally. One local company uses 'click' plastic boxes which are easy to use, but nobody commented on this packaging.

Main Usage

Overall, table use and cooking were equally identified as the end use of goat cheese, with restaurants the main users for cooking. Cooking would appear to offer considerably expanded use, and recipes are requested by retail outlets.

Supply

Seasonality of milk supply has been identified as a problem for cheesemakers, however it is not a

problem for retailers or restaurants. One distributor noted it is not a problem with regard to supply from larger cheesemakers, who stockpile. Consistency and availability were not identified as a problem either.

Limiting Factors

Factors limiting acceptance of goat cheese included product knowledge, willingness to try, taste, variety, lack of range, price, availability, customer preference and quality. More product knowledge, through description of cheeses (particularly for restaurants), recipes, storage hints, and shelf life, would appear to assist overcome the main limiting factors. The price issue should be monitored carefully in view of the cheapness of imports. Quality issues, in particular variability and undesirable texture, were identified as problems in the first survey, when it was clear that some customers were not getting what they wanted.

Problems & Suggestions

'Product knowledge', 'willingness to try', 'taste' and 'variety' responses underline the requests for information in this section. There is a greater range available than many are aware of, and this indicates a need for promotion. There is a general need to identify and describe goat cheeses, and to give details of their nutritional value, and reasons to use goat rather than cow cheeses.

Conclusions

- There is an established market for goat cheese in Victoria. Food service and supermarkets are the biggest customers.
- The trend appears to be for wider use. The surveys have identified a 'widespread' range of customers.
- Retail sales were generally described as 'steady', but some distributors identified increased usage. This seems to suggest more outlets.
- Quality issues are linked to consumer expectations and are difficult to objectively quantify. There were no complaints about quality in the second survey. 'Smooth and creamy' is a fairly constant ideal.
- Seasonal shortages were not an issue for those surveyed, probably due to cheesemakers' ability to stockpile.
- Knowledge about goat cheeses remains limited. Flavour expectations vary between customers and they have only experience to guide them in selection.
- Some retailers mentioned lack of variety, but on further discussion it was found that they were unaware of many varieties that are available from their current distributor/s. Also some distributors have a limited range. Promotion is essential, linked with information as above.
- Gaps in the market can occur as has happened recently with a Norwegian hard cheese being no longer available, and retailers were unaware of the local product.
- Extension of use in cooking would assist the retail end, and recipes were requested.
- There appears to be considerable opportunity for information and promotion of the range of goat cheeses across many sectors of the food industry and perhaps for expansion of the range.
- Imported product poses real and potential problems, although the exchange rate has been a positive factor. Fetta suffers most from import competition, and related to this is the continuing problem of the source of milk in fetta (an issue of international interest at the present). Chevre imports remain a potential threat.
- Health issues are a minor consideration but do come up. Information is needed here too.
- At farmer/cheesemaker level, availability and quality issues appear to have been addressed as far as the cheese marketplace is concerned. The issue of stockpiling is one that cheesemakers need to pursue with farmers, and costings for out of season milk should be established. It has been demonstrated that out of season kidding is feasible in Victoria under pasture based systems.

Recommendations

- An educational campaign is needed. At retail level, description of cheeses, recipes and serving suggestions, storage hints, shelf life, nutritional and other information is required. Printed material and display systems should be provided. Well-known chefs should be approached to participate.

Restaurants would welcome description of cheeses. Some distributors would welcome the range of information.

- The ADC should promote the results of the Australian Specialist Cheesemakers' Association (ASCA) Cheese Show, of which it is a sponsor. Goat cheeses do well there.
- Invitations to the ASCA Cheese Show should be issued for future market survey participants, and perhaps a free entry could be offered for one or more participants in the future, as an incentive to fill out the forms.
- Identification and labeling of particular cheeses with regard to flavour and texture (and related to this, maturing and shelf life) is needed.
- There may be opportunities for new style cheeses, but the market size for these may be small.
- A common 'language' related to the above should be developed; cf meat 'language' used by Meat & Livestock Australia.
- The source of milk in imported fetta should be investigated.
- Monitoring of price issues and price importance in the marketplace should be undertaken.
- Use of the Internet for promotion and ordering/sales, perhaps by a distributor, or a group formed for the purpose.
 - Market surveys should be continued from time to time by AGMA and ASCA.

Industry Development

Introduction & Aims

Throughout the project, to continue the liaison and discussion commenced in the previous phase, meetings were arranged with industry stakeholders and frequent contact maintained with all sectors of the commercial goat cheese industry. Surveys and field days also assisted this continuing dialogue and personal liaison with interested parties. An "Industry Meeting" was held each year and well attended by a cross section of producers, cheese makers and marketers.

The broad objective was to co-ordinate and develop the industry along sound commercial lines so that production quantity and quality matched market demand, and the industry as a whole worked together to promote goat cheese consumption. This objective was expanded towards the end of the project to investigate opportunities for other goat milk products and to enlist the assistance of other organisations in finding new domestic and export markets.

Australian Goat Milk Association

The major result from industry liaison and meetings was the eventual formation of the "Australian Goat Milk Association" (AGMA) in February, 2000, for the purpose of representing, promoting, co-ordinating and monitoring the Australian dairy goat industry. It was agreed that the Association also affiliate with the Australian Specialist Cheesemakers' Association, a body with complementary objectives, and which gave consistent support for the concept of AGMA.

The AGMA Committee includes producers and processors, and membership covers all States. Several bi-monthly newsletters have been produced and circulated and a website has been launched. The first annual meeting was held in December, 2000. The Association has had limited success in attracting wider interest to date, due partly to present constraints on the industry, but with time is expected to be a uniting and positive force for all participants.

The objectives of AGMA are:

- To promote and advance Australian goat milk products
- To represent the goat milk industry to the food industry, governments and the wider community
- To assist the efforts of dairy goat farmers, goat milk processors and goat milk product merchants in the marketing of Australian goat milk products
- To develop a vision statement and forward plan for the Australian goat milk industry
- To encourage research, development and extension in the goat milk industry
- To encourage the highest standards of production and marketing efficiency and quality
- To compile goat milk industry production and marketing data
- To represent and disseminate relevant information to the members

Current Industry Status

From a position of under supply at the start of the project, the industry faced a difficult period as milk and cheese production increased beyond the capacity of the local market and was still too heavily weighted towards the spring months. Milk prices on offer, ranging from 65 cents to \$1 per litre, and market prospects encouraged rapid expansion in the number of herds and goats to the point where, like most emerging industries, excess supply quickly occurred. However, supply has now decreased with some producers leaving the industry but there will possibly still be a winter shortfall in the short term (see Fig 1, Appendix II, page 62).

Efforts were made by several industry people and the project researchers to investigate the potential of other goat milk products such as milk powder, fresh and UHT milk. A goat milk powdering trial was organised through the facilities of the Victorian Department of Natural Resources and Environment (DNRE) and Food Science Australia. Export demand for milk powder appears to be strong, however accessing suitable processing facilities has been a problem. Several attempts have been made by some producers to organise manufacture and export outlets for milk powder and UHT milk, without success at this stage. The major problem in embarking on powder and UHT milk production is securing supply of the quantity of milk, on a regular basis, to profitably operate plants, and meet export market demands.

A project was initiated with DNRE and funded by RIRDC (Project DAV-172A), to determine market prospects in several Asian countries for goat milk products, particularly for cheese in the immediate term. This project contracted Austrade to conduct overseas investigations and contact was continued with Austrade officers by the project researchers. Positive results have yet to be achieved.

Interest in goat dairying from the dairy cow sector has been evident since deregulation, and deregulation funds have been directed to investigations, notably in Tasmania and Queensland. A large dairy company in Queensland is currently supplying pasteurised goat milk locally and interstate. Local government bodies in North West Tasmania and South East Queensland has commissioned market research to examine prospects for powder production

Whilst longer term prospects for dairy goats appear good, caution is needed at the moment with regard to the current supply/demand situation. There still appears to be untapped potential in the domestic market for cheese, which could be realised with more promotion, and sound export prospects for several goat milk products. The international marketplace must of course be taken into account and the industry here needs to maximise its natural advantages, especially with regard to cost effective, environmentally friendly, pasture based production, and other relevant lessons from the mainstream dairy industry.

Recommendations

- It is crucial that the industry, through AGMA, presents a united front to promote and advance Australian dairy goat milk products and to attempt to regulate supply according to market estimates.
- AGMA must continue to promote membership so that it is seen to be truly representative of the majority of the industry.

- AGMA should continue to develop several of the outcomes of this project, particularly the Computer Program and the Dairy Goat Note Manual, and should implement a Farm Survey on a regular time scale.

Study Tour

Introduction & Aims

An important component of the project was to have an industry study group visit a country with a well established and world recognised goat cheese industry. The country selected was France, and the tour was scheduled to coincide with the International Conference on Goats, held in Tours, close to the heart of the French dairy goat industry, from May 15-21,2000. The prime objective of the tour was to compare project achievements, and Australian developments in farm management, herd improvement, cheese production and marketing techniques, with practices in a more mature production and marketing system.

The Study Group, comprised of the project researchers, David Brown, Managing Director, Milawa Cheese Company, and President of the Australian Specialty Cheesemakers Association, and Mrs Jo Hall, Childers Focus Farm, attended the International Conference on Goats and made several field visits in association with the conference. The group concentrated on conference topics of particular interest and relevance for Australia including: nutrition and feeding strategies; parasite control; mastitis control; pathology; CAEV; udder and milking capacity; genetics and selection; reproduction; quality of milk and dairy products; regional goat industries; goat milk collection and processing; and technology of goat milk and cheese. Contact was made with as many relevant people and organisations as possible, during and after the conference, and a report was compiled for industry information (Appendix III).

Lessons for Australia

General Observations

Economic and social structures of countries have many differences that are quite profound. France is a large and wealthy nation that has the will and can afford, it appears, to offer support to rural sectors that Australia can only dream about. However, government support implies a level of bureaucratic interference that we might find difficult to cope with. Tradition is valued highly in France but is often difficult for the bureaucracy to deal with. For example, there have been complaints about how 'appellation controllee' has been applied to cut across local practice, but the system is valued.

Regionality in France means that local produce is traditional fare, and may not be readily available outside its region. Large urban areas are more cosmopolitan. In Australia, regionality means identifying where a product comes from, and does not imply any regional tradition. In fact it may be difficult to buy an Australian regional product in its own region and locals may rarely use it. Australian consumers appear more experimental.

Farming Methods

Dairy goat farming and feeding practices in France bear little relationship to Australian methods. The norm of zero grazing and intensive housing evident in France is the exception in Australia where some reliance on grazing pastures and forages is relatively high. Economic circumstances in France, notably cropping subsidies, appear to facilitate their 'high input' system, however climatic conditions and problems with worm control may have contributed to the present situation.

Nevertheless, provided effective worm control practices and adequate nutrition are maintained, it is considered that a prudent approach in Australia will be to continue to focus on low cost, pasture grazing based farming, of a reasonable scale, to produce a sufficient, reliable supply of high quality milk, at a reasonable price, to support a viable processing sector. This will enable the industry to be internationally competitive and capitalise on export market opportunities for cheese, and new

markets such as powder and other products, whilst sustaining and growing the domestic market. Significantly, the French also recognise that grazing produces a better flavour in cheese.

Attention to feeding rations, and the paramount importance of an adequate energy and protein supply for young and milking goats, is no different between France and Australia. In contrast to Australian needs, French farmers have to rely on concentrate, and in some cases mineral, supplementation because of their intensive feeding methods. Some work with feed additives, used as buffers or as infection inhibitors, may have future relevance to our conditions. In addition, information about the influence of fibre types and lipid additives on fat levels and composition will be useful as cheesemaking becomes more sophisticated

Kid rearing techniques in France are conventional, and target weights and ages for weaning, joining and mature goats are similar to those followed in Australia. Condition scoring does not appear to be a management tool in France.

Animal Health

Dairy goat herds in France have most of the health problems experienced in other temperate countries, but in comparison with Australia, probably have higher metabolic disorders and lower parasite burdens due to the prevalence of intensive feeding. Reasons for deaths and culling, as compiled in a French survey, need to be compared with Australian experience to identify differences more precisely. Work being conducted on CAEV, Listeriosis and other health concerns will be of benefit to Australia.

Worm control strategies practised in France, particularly in grazing herds, are generally identical to those in Australia, as are problems with drench suitability and resistance. The importance of adequate drench doses, proper drenching strategies, and better nutrition for resilience to infestation apply equally to both countries. Developments that may have widespread benefit in the longer term, apart from drug research, include production of vaccines and use of a fungus predatory to worm larvae. Genetic selection for resistance to worms has been shown to be effective, however it must complement other important breeding objectives.

Mastitis in French dairy goats is probably no better or worse than elsewhere, and is the major reason for culling. A considerable amount of work is being undertaken on defining target SCC levels for maximum milk production and quality, which in turn affect cheese yields. In the meantime, it appears that a bulk SCC threshold of 500,000, as measured by Fossomatic machines, will be an appropriate interim goal.

Genetic Improvement & Breeding

Probably the most valuable lesson for Australia are the achievements in genetic improvement of the French dairy goat herd. These have resulted from a systematic program, begun in the '60's and based on fundamental genetic principles, which has yielded not just increases in production per animal, but more importantly increased efficiency of production in terms of milk components that influence cheese yields and flavour.

Australia should follow the same path (identical to that used in our dairy cow industry) and implement a national genetic improvement program based on extensive milk recording, AI, and progeny testing of bucks. Appropriate selection objectives will need to be determined based on the intended major goat milk products. To expedite improvement, importation of French buck semen should be undertaken to introduce and spread the level of genetic merit in cheese production already achieved in France.

Techniques for the use of AI, and induction or synchronisation of oestrus, whilst more widely used in France, are the same as those known and used in Australia. Extension of these methods in Australia will be of great benefit in achieving a more consistent, regular supply of milk throughout the year.

Manufacturing

From observations of several French factories, Australian goat cheese manufacturers can be proud of their achievements. Operating in isolation in most cases, our cheesemakers have developed techniques similar to those developed in France over centuries. One factory visited was not highly mechanised and the manual handling of curd offered no revelations, whereas the attention to detail shown in on farm situations is also evident in Australian products, such as those from Kervella, Woodside and Gympie. The ready acceptance of Australian cheese at the Cheese Buffet is proof of this. Pre-ripening techniques used were of interest and it is probable that some advanced factories could be used as models for a more efficient, mechanised approach to making some of the simpler cheeses.

Milk & Product Quality

Payment criteria developed in France have potential application in Australia for underpinning milk quality of the highest manufacturing standard. Apart from purity criteria, such as residues and bacterial counts, and protein and fat content, such measures as SCC, immunoglobulin level and lipolysis rating have very significant relevance to Australia and should be considered sooner rather than later.

Marketing

There are considerable differences between the more traditional farms and larger modern farms. Markets for the smaller on-farm cheesemakers were farm gate and local street markets, and this is having to change. Local markets in the old part of town were once cheap places to shop, but supermarkets are now cheaper. Lifestyle changes include shopping habit changes too. Young shoppers and people with cars use supermarkets more. As noted elsewhere, even in this very conservative country, mass produced cheese is the sector showing growth. The traditional sector may be suffering less from the dreaded EU interference than from changes in shopping habits. A farmer organisation has expressed concern about growing customer sensitivity to food safety issues and the need to deal with these. Others within the industry expressed similar concerns.

Eating habits differ. It is not usual to cook with goat cheese in France. A book of goat cheese recipes was available at the Conference and we were told that this was a very new idea. Local producers agreed. In Australia, goat cheese is used widely in cooking (possibly its main use) and is a reason for the predominance of plain soft chevre.

Sensitivity to markets is high. As mentioned, terroir, or the influence of specific local conditions on product, is taken very seriously. One 'appellation controllee' region now prescribes grazing for goats, where housing had been practiced for some time. The French trade very much on perceptions of tradition and regionality, but also exploit other markets, which are growing rapidly. Exporters produce fetta, milk powder and ready-to-cook, prepacked cheese dishes which have very little French market demand. French packaging for goat cheeses (plastic containers and wraps) are used world wide.

The French 'scene' is diametrically opposed to the Australian experience where by far the great majority of cheese is automatically produced in large factories and purchased in supermarkets. Under these circumstances Australian goat cheese producers who are all small scale and manufacturing "specialty cheese" face the continuing challenge of introducing the reluctant public to the delights of cheese other than mild cheddar. The Australian Specialist Cheesemakers Association pursues this promotional activity to the extent of its resources, but without the assistance of the Australian Dairy Corporation in goat cheese promotion it is an uphill battle.

Recommendation

- The industry should attempt to organise co-ordinated study tours occasionally to countries with significant dairy goat industries.

5. Appendices

Appendix 1: Dairy Goat Farm Survey Summaries – 1997, 1998, 1999

Farmer Report Form

Survey Questionnaire – 2000

DAIRY GOAT FARM SURVEY - 1997

SURVEY REPORT

Response

25 survey questionnaires were returned out of a total of 53, a response rate of 47%.

Responses by State were: Vic - 11; NSW - 6; Tas - 4; SA - 3; WA - 1; which are in close proportion to the overall response rate.

All except three respondents, who were just starting in 1997/98, were involved in goat dairy farming in 1996/97, the survey year.

Farm Details

a) Area

20 respondents were using their dairying area mainly for grazing, the size ranging from 2 - 81 hectares. Two respondents had goats intensively housed.

b) Stocking

The number of milking does run on the dairying area averaged 79, with a range of 11 - 350.

Range of herd sizes was:

10/50 does	- 9 farms	101/150 does	- 2 farms
51/100 does	- 9 farms	151 + does	- 2 farms

Kids, goatlings and bucks were usually run on the dairying area. Only 3 farms used agistment or run/off and 2 farms used contract rearing for kids.

c) Stocking Rate

Effective stocking rates on the dairying area in 'milking doe equivalents' were calculated based on kids as 0.33, goatlings as 0.5 and bucks as 0.7 'doe equivalents'.

Stocking rates ranged from 0.3 - 10.1 doe equivalents/hectare. 7 farms had stocking rates greater than 5.0 doe equivalents/hectare.

d) Feed

21 farms brought in grain/pellets, 16 brought in hay and 5 brought in 'other' feeds for feeding on the dairying area.

Total amount of feed used, based on the 'grain equivalent' (as calculated on energy content) ranged from 0.05 - 1.81 tonnes per doe equivalent.

e) Dairy Shed

11 dairy sheds were swing/over herringbone, 3 were double/up herringbone, 2 were walk/thru, and 7 were other types, mostly single/side herringbone.

6 farms planned to upgrade their sheds in 1998.

18 farms had one operator in the shed, 5 had two or more.

Average peak season throughput was 61 does/hour with a range of 12 - 120.

f) Milk Storage/Delivery

Vat storage capacity ranged from 45 - 2000 litres.

Cooling systems used were: Pre-cooling - 12 farms; Direct expansion vat - 15 farms;
Cool room/ice - 2 farms

Self delivery, twice a week, was the most common method and frequency of milk transport.

g) Fertiliser

15 farms reported fertiliser use, usually superphosphate with some using potash also.

Dairy Herd Details

24 farms planned to increase herd numbers in each of the next three seasons, only one herd was to remain the same size.

Average number of milking does expected by year is:

96/7 - 79 (11-350); 97/8 - 90 (14-380); 98/9 - 135 (22-700); 99/0 - 179 (30-850)

Nearly all farms forecast kidding to be concentrated between August - November, including ten suppliers to cheese factories. Only three farms planned a spread of kidding through the year.

Herd Improvement Details

7 farms were using herd testing and one using AB in a small way.

Production Details

16 farms sold milk to factories, 7 sold milk for other purposes, and 10 used milk for other purposes.

Average production per milking doe was 508 litres with a range of 209 - 938.

Adjusted production per doe, after allowing for young stock and bucks run on the dairying area, averaged 686 litres with a range of 234 - 1313.

Feed cost, based on grain equivalent at \$170/tonne and adjusted production figures, ranged from 1 - 35 cents per litre.

Management Details

The majority of farms were managed and operated by owners/family with a combination of full and part-time involvement. Three of these had a part-time involvement only. 7 farms had full-time or part-time employees assisting owners/family and one farm was operated solely by employees.

DAIRY GOAT FARM SURVEY - 1998

SURVEY REPORT

Response

19 survey questionnaires were returned out of a total of 44, a response rate of 43%. Responses by State were: Vic - 6; NSW - 6; Tas - 3; SA - 3; WA - 1.

All except one respondent, who was just starting, were fully involved in dairy goat farming in 1997/98, the survey year. 16 of the respondents also participated in the 1997 survey.

Farm Details

a) Area

15 respondents were using their dairying area mainly for grazing, on an average of 32 hectares, with a range from 5 - 77 hectares. Four respondents had goats mostly intensively housed.

b) Stocking

The number of milking does run on the dairying area averaged 75, with a range of 13 - 160. Range of herd sizes was:

10/50 does	- 7 farms	101/150 does	- 4 farms
51/100 does	- 6 farms	151 + does	- 1 farm

Proportion of milking does on their first lactation averaged 25%, ranging from 5 - 70%

Kids, goatlings and bucks were usually run on the dairying area. No farm used agistment or run/off. Milking doe equivalents, based on kids as 0.33, goatlings as 0.5 and bucks as 0.7 'doe equivalents', averaged 97 with a range of 20 - 210.

c) Stocking Rate

Effective stocking rates on the dairying area averaged 4.8 doe equivalents/hectare and ranged from 1.9 - 12.6. 5 farms had stocking rates greater than 5.0 doe equivalents/hectare.

d) Feed

18 farms brought in grain/pellets, 16 brought in hay and 5 brought in 'other' feeds for feeding on the dairying area.

Total amount of feed used, based on the 'grain equivalent' (as calculated on energy content) averaged 36 tonnes with a range of 3 - 166.

Grain equivalent per doe equivalent averaged 0.40 tonnes and ranged from 0.03 - 0.87 tonnes.

Grain cost per doe equivalent, based on a uniform price of \$170 per tonne, averaged \$69 and ranged from \$5 - 148.

e) Dairy Shed

3 dairy sheds were swing/over herringbone, 7 double/up herringbone, 7 single/side herringbone and 1 was a walk/thru.

Sets of cups ranged from 1 - 20 with 8 - 12 the most common number.

9 farms planned to upgrade their sheds within the next year.

12 farms had one operator in the shed, the remainder two.

Average peak season throughput was 59 does/hour with a range of 15 - 120.

f) Milk Storage/Delivery

Storage capacity ranged from 20 litre buckets up to a 2500 litre vat. Vat sizes were usually between 1000 - 1600 litres.

Vat cooling was used on 11 farms, in conjunction with pre-cooling in line on 2 farms. Others used pre-cooling in line, buckets in ice, cool room, or milk went straight to cheese making. Self delivery, either twice or once a week, was the most common method and frequency of milk transport. Food grade plastic was the usual container.

g) Fertiliser

13 farms reported fertiliser use, usually superphosphate with some using compound mixtures, urea or lime.

Dairy Herd Details

All farms planned to increase herd numbers in each of the next three seasons.

Average number of milking does expected by year is:

97/8 - 75 (13-160); 98/9 - 95 (20-200); 99/0 - 117 (30-220); 00/1 - 144 (40-300)

Kids to be raised in 98/9 averaged 60, ranging from 10 - 200.

7 farms planned to spread kidding through most of the year. Others tended to concentrate kidding in the second half of the year, usually in early spring.

Herd Improvement Details

7 farms were using herd testing, three using AB, and one intending to start AB in '99.

Production Details

12 farms sold milk to factories, 7 sold milk for other purposes, and 8 used milk for other purposes.

Average production per milking doe was 487 litres with a range of 170 - 968.

Adjusted production per doe, after allowing for young stock and bucks run on the dairying area, averaged 654 litres with a range of 206 - 1187.

Feed cost, based on grain equivalent at \$170/tonne and adjusted production figures, averaged 11 cents per litre and ranged from 1 - 29.

Management Details

The majority of farms were managed and operated by between one and two persons.

Summary

The 1998 survey resulted in another very satisfactory response rate and produced an additional package of information about the dairy goat industry. Farmers intend to increase herd sizes (and milk production) steadily over the next few years, but still rely heavily on brought in feed. Key benchmarks were similar to those from the 1997 survey and will provide respondents with guidelines for their own performance.

DAIRY GOAT FARM SURVEY - 1999

SURVEY REPORT

Response

19 survey questionnaires were returned out of a total of 37, a response rate of 51%. Responses by State were: Vic - 7; NSW - 5; Tas - 3; SA - 2; WA - 2.

All except one respondent, who was just starting, were fully involved in dairy goat farming in 1998/99, the survey year. 11 of the respondents have participated in all three surveys conducted, 2 in the '97 and '99 surveys, and 2 in '98 and '99.

Farm Details

a) Area

14 respondents were using their dairying area mainly for grazing, on an average of 36 hectares, similar to previous years, with a range from 4 - 100 hectares. Five respondents had goats mostly intensively housed.

b) Stocking

The number of milking does run on the dairying area averaged 117, with a range of 17 - 460. This average was sharply up on last year due to inclusion of a large herd.

Range of herd sizes was:

10/50 does	- 3 farms	101/150 does	- 5 farms
51/100 does	- 6 farms	151 + does	- 4 farms

Proportion of milking does on their first lactation averaged 36%, ranging from 17 - 66%. Kids, goatlings and bucks were usually run on the dairying area. Four farms used agistment or run/off for part of the year.

Milking doe equivalents, based on kids as 0.33, goatlings as 0.5 and bucks as 0.7 'doe equivalents', averaged 138, with a range of 27 - 483.

c) Stocking Rate

Effective stocking rates on the dairying area averaged 5.8 doe equivalents/hectare and ranged from 1.3 - 13.8, a slight increase on the previous year. 5 farms had stocking rates greater than 5.0 doe equivalents/hectare.

d) Feed

18 farms brought in grain/pellets, 14 brought in hay and 3 brought in 'other' feeds for feeding on the dairying area.

Total amount of feed used, based on the 'grain equivalent' (as calculated on energy content) averaged 61 tonnes with a range of 9 - 171,

Grain equivalent per doe equivalent averaged 0.47 tonnes and ranged from 0.10 - 0.99 tonnes.

Grain cost per doe equivalent, based on a uniform price of \$170 per tonne, averaged \$81 and ranged from \$17 - 168.

Feeding amounts and ratios have increased steadily since the first survey year.

e) Dairy Shed

6 dairy sheds were single/side herringbone, 7 double/up herringbone, and 5 of other types.

6 sheds were due to be upgraded within the next year or so.

Sets of cups ranged from 2 - 32 with 6 - 12 the most common number.

9 farms had one operator in the shed, 6 had two operators, one had three, and the others between one and two.

Average peak season throughput was 92 does/hour with a range of 15 - 250.

f) Milk Storage/Delivery

Storage capacity ranged from cans to a 3650 litre vat. Vat sizes were usually between 1000 - 2000 litres.

Vat cooling was used on 12 farms, in conjunction with pre-cooling in line on 5 farms. Others used pre-cooling in line, buckets in ice, cool room, or cooler bricks.

Self delivery was the most common method of milk transport to factories, at a frequency ranging from thrice to once a week. Food grade plastic was the most common container.

g) Fertiliser

13 farms reported fertiliser use, usually superphosphate, with some using compound mixtures, urea or lime, or organic fertiliser.

Dairy Herd Details

Nearly every farm planned to increase herd numbers over the next three seasons. Average number of milking does expected by year is: 98/9 -117 (17-460); 99/0 -140 (24-450); 00/01 -174 (30-500); 01/02 -199 (35-500).

Kids to be raised in 99/0 averaged 83, ranging from 15 - 250.

6 farms, mainly those processing their own milk, planned to spread kidding through most of the year. Others tended to concentrate kidding in the second half of the year, usually in late winter - early spring.

Production Details

13 farms sold milk to factories, generally for cheese manufacture, 8 sold milk for other purposes, and 10 used milk for other purposes. 7 farms processed milk on farm for whole milk sales, yoghurt or cheese production.

Average production per milking doe was 537 litres, with a range of 237 - 820.

Adjusted production per doe, after allowing for feed consumed by young stock and bucks run on the dairying area (which could have gone into milk production), averaged 655 litres, with a range of 277 - 1191.

Brought in feed cost, based on grain equivalent at \$170/tonne and adjusted production figures, averaged 13 cents per litre and ranged from 4 - 26. Costs were higher on farms where goats were intensively housed.

Parasite Management

A very wide range of systems and conditions were reported (see details on next page). Given that parasites are supposedly a big problem, farmers' comments over the range of systems generally don't reflect this. Planning and assessment are generally not well targeted. Assessments of whether there is a problem or not, and of how effective management strategies are, is very subjective.

Problems can be due to many other factors, and whilst poor condition may be due to worms, production may be lost before these symptoms develop.

Anthelmintic dosages were very variable. Faecal egg counts were not widely used. The signs and symptoms widely relied on may be due to many things. Drench tests (for effectiveness of drench) were even less widely used. Rotation of pastures was used in varying ways, and probably with varying results.

Financial Performance

Responses to this section of the survey were very variable in range and completeness.

Unfortunately, it was not possible to draw any conclusions from the data provided.

Summary

The 1999 survey has resulted in another very satisfactory response rate and produced an additional package of information about the dairy goat industry. Farmers again intend to increase herd sizes (and milk production) steadily over the next few years, which increases the need for a strong

marketing effort by the industry. Most farms still rely heavily on brought in feed rather than pasture grown on farm. Key benchmarks were similar to those from the 1998 survey and will provide respondents with guidelines for their own performance.

PARASITE MANAGEMENT

Worm control practices for the milking herd (19 farms responded)

DRENCHES

Types	12 used ivermectin 3 used cydectin 2 used a white drench ('Systemex', 'Panacur' etc) 1 used levamisole ('Nilverm') 1 used closantel (for barber's pole) 1 used 'organic drench' 5 used combinations of the above. 4 did not indicate or did not use
Dose	variable. Ivermectins ranged from 9-20ml. Strength not noted. 4 adjusted dose acc/ to animal weight 1 used 1½x recommended dose
Frequency	2 -once a year 6 -twice a year 1 -three times 6 -four times 1 -seven times 1 -daily some in combinations of the above, eg ivermectin when does dry, white during lactations

FAECAL EGG COUNTS 5 used FEC; 14 did not

Frequency	1 -monthly 2 -two monthly 1 -three-four monthly 1 -did not specify
Timing	1 -post drench 1 -when problem is suspected
Drench test	2 used drench test, 16 did not 1 -2-3 times year 1 -according to count

PASTURE MANAGEMENT

	10 -rotation 1 -fresh paddock post drench 1 -clean-up after crops 1 -limited grazing 1 -forage crops 1 -'natural' pasture 1 -pasture over 20cm 1 -topping of excess growth Note: 1 farm noted that frequent rotations and improved pasture are not helpful
--	--

OTHER

- 1 -feed hay before grazing wet pasture
- 1 -good diet, vitamins, minerals
- 3 -largely hand fed
- 1 -hay when feed short

How do you decide what strategies to use and when to use them?

- 3 -FEC's
- 1 -after kidding
- 7 -visual assessment: appearance, production, symptoms
- 1 -pasture condition
- 1 -policy-zero worm tolerance; FEC
- 10 -not stated

How effective are your strategies?

- 6 -good
- 2 -fair
- 1 -lessening
- 1 -poor
- 9 -not stated

How do you measure effectiveness?

- 10 -visual: appearance, production
- 2 -symptoms: scour, death
- 3 -FEC's
- 8 -not stated

Comments

Very wide range of systems and conditions, so it isn't possible to generalize. However it is possible to make some observations.

Parasites are usually supposed to be a big problem, but farmers' comments (over a range of farming systems) generally don't seem to support this.

Is some drenching simply conventional practice?

Planning and assessment are not always well targeted.

FEC's not widely used. The signs and symptoms widely relied on to assess whether there is a problem and whether it has been adequately managed, may be due to other things. Drench test (for effectiveness of drench) is even less widely used than FECs.

NB: Ivermectin is still detectable in milk 6 weeks after use.

Dosages are very variable, but note that drench strength was not asked for or given.

Rotation of pastures may be useful or not according to how it's done. One respondent noted that rapid rotation on very productive pasture was not helpful.

Some respondents noted that stock was largely hand fed. This may or may not have an effect on worm burdens. (Note pers. comm. from NZ and some local experience where stock with very limited access to pasture had considerable problems.)

Suggestions

1. Identify if there is a problem. Coat condition can be very misleading, especially in paddock-run stock in spring and early summer. It is more important to assess body condition score using a score index. Condition will drop in the first 6-8 weeks after kidding as does, especially high producers, 'milk off their backs'. Scour is not a certain indicator of worms, it is often due to feed changes.

2. Identify what the problem is. Faecal egg counts are essential here. You will need to work with your vet. High FEC may not indicate the primary problem, but should be treated. There may be underlying management or disease issues. Animals in poor condition to begin with, may be more susceptible to parasites; therefore removing worms may improve condition but not deal with the cause. Eg: inadequate nutrition – poor condition - parasites – drench – improved condition – but necessarily recurring.
3. Treat the identified problem. Be careful not to under drench. It has been suggested but not proven that goats may need more per kg/bodyweight than sheep or cattle. Clear drenches eg levamisol can produce adverse reactions even at recommended doses.
4. Assess effectiveness of treatment. May include Drench Test if worms were identified as a problem.
5. Ineffective results mean the whole picture needs to be looked at again.
6. Be aware of residues. These are going to become much more of an issue.

DAIRY GOAT FARM SURVEY 1999

FARMER REPORT to _____

DATA ITEM	YOUR FARM	AVERAGE *	RANGE
Dairying Area (ha)		36 (32)	4 - 100
Milking Does (DM)		117 (75)	17 - 460
Doe Equivalents (DE) (1)		138 (97)	27 - 483
Stocking Rate (DE/ha)		5.8 (4.8)	1.3 - 13.8
Grain Equivalent (GE) (tonnes) (2)		61 (36)	9 - 171
Shed Throughput (does/hour)		92 (59)	15 - 250
Herd Size 1999/00		140 (95)	24 - 450
2000/01		174 (117)	30 - 500
2001/02		199 (144)	35 - 500
Production/DM (litres)		537 (487)	237 - 820
Adjusted Production/DE (litres) (3)		655 (654)	277 - 1191
GE/DE (tonnes)		0.47 (0.40)	.10 - .99
GE Cost/DE (\$) (4)		81.00 (69.00)	17.00 - 168.00
GE Cost/Litre (cents)		13 (11)	4 - 26

(1) 'Doe equivalents' (DE) are calculated based on Kids (rising 1 year old) as 0.33, Goatlings (rising 2 years old) as 0.5, and Bucks as 0.7 'milking doe equivalents in terms of annual energy requirements.

(2) 'Grain equivalent' (GE) is calculated based on the energy content of feed brought in and fed on the dairying area, eg, Hay has a 'grain equivalent' of 0.7.

(3) Adjusted production takes into account the number of young stock and bucks run on the dairying area and consuming feed that otherwise could have produced milk.

(4) Grain equivalent cost is based on a uniform price of \$170 per tonne for comparative purposes.

* Figures in brackets are averages for 1997/98

Your production performance since 1996/97 is shown below:

	Prodn./DM	Prodn./DE	GE/DE	GE Cost/DE	GE Cost/L
1996/97					
1997/98					
1998/99					

Rural Industries Research and Development Corporation - Project PTP-11A

Improving Productivity and Specialty Cheese Production in the Australian Dairy Goat Industry – Phase 2

DAIRY GOAT FARM SURVEY 2000

The Survey

This is the 4th annual survey, following the three successful surveys conducted in '97, '98 and '99. It is aimed at establishing a system for collection of statistics on herd and goat numbers, location, production, management and herd improvement practices, and cost of production. By measuring the industry in this way, at regular intervals, all sectors will benefit. Farmers will gain from comparison of their performance with other farms. Cheese manufacturers will be able to plan more positively from farm predictions. The industry as a whole will benefit from improvements in productivity that will accrue from establishment and periodical review of industry benchmarks.

Feedback

All farmers who respond to the survey promptly will receive their own confidential report, comparing their farm performance with others. A full survey report, aggregating all responses and masking individual identities, will also be produced for industry information, and will provide data on benchmarks, predictions and trends.

Where do I start?

Just answer each question, which start below, as shown. About 20 minutes is all you need. When you have finished, please return the questionnaire in the return addressed, postage paid envelope provided. Please send in your returns by **October 30,2000**, to enable quick analysis and reporting back to you. **Your data will be treated with strict confidentiality at all times.**

If you have any queries regarding this survey, contact Arthur Stubbs on (03) 9844 1135 or Gaille Abud on (03) 9718 2041

The details requested (except for predictions) are for the period 1/7/99 - 30/6/00. Thank you in anticipation of your co-operation.

Please answer the following questions by ticking the appropriate box or by supplying the requested figure

RESPONDENT DETAILS

Name _____ Telephone (____) _____

Address _____ P/Code _____

1. FARM DETAILS (for 1999/00)

(a) **Farm area**

For calculation of production per area unit please provide details (in hectares or acres) of the farm area used as per the following table. (**1 hectare = ~ 2.5 acres**)

Dairying area *	hectares	acres
Non-dairying area	hectares	acres
Total area	hectares	acres

***Dairying area** is land used primarily for the dairying enterprise and includes grazing and buck paddocks, lanes and shed areas. Do not include land used exclusively for making hay/silage or cropping.

Note: Please indicate if your milking does are predominantly housed and fed indoors.

1. FARM DETAILS for 1999/00 (continued)

(b) Stocking(i) How many milking does (in total) were run on the dairying area during 1999/00 ? (ii) How many milking does were on their first lactation ? (iii) Apart from milking does, which of the following stock were run on the dairying area during 1999/00 ?

Stock Type	No. of Head		Whole Year (✓)	No. of Weeks
Kids (rising 1 year old)		(for)		
Goatlings (rising 2 years old)		(for)		
Bucks		(for)		

(c) Agistment/Run-off

Please provide the details of any agistment, run off and contract rearing of dairy stock during the 1999/00 season including does run off the dairying area, eg, numbers of kids, goatlings and does and number of weeks:

d) Feed Brought In to the Dairying Area

Please indicate what quantities of feed (if any) were purchased or brought in and used during the 1999/00 season on the dairying area (in tonnes). Exclude any quantities left over or stored at the end of the year.

(Note: 40 standard rectangular hay bales equals 1 tonne; please convert other bale/roll sizes to tonne equivalent)

Hay tonnes Grain/Pellets tonnes Silage/Brewer's Grain tonnes Other tonnes

(e) Dairy Shed

(i) Please indicate the type of dairy shed in operation on the farm:

Single side Doubled up Other (describe) _____

(ii) Do you plan to upgrade or replace your shed in the foreseeable future?

No Yes and if YES approximately (Which Year?)

(iii) How many sets of cups apply to the current system? (iv) How many operators are used in the shed for the peak milking period?

1. FARM DETAILS for 1999/00 (continued)

(v) What is the throughput (does per hour) of this system during the peak season ?

(vi) What is the total milk storage capacity of the farm's vat(s) (in litres) ?

(vii) If you transport milk to a factory, what system is used ?

Self delivery Collection by factory

and what is the frequency of transport? Days

(f) **Fertiliser**

What fertiliser (s), if any, were used on the grazing area in 1999/00 ?

Type of Fertiliser	Total Amount (tonnes)

2. DAIRY HERD DETAILS

(a) How many does were culled, disposed of, or died in the 1999/00 season ?

What were the main reasons for does exiting the herd ? (please give the number in each category)

Low Production Infertility Udder Conformation

Kidding Problems Mastitis Health Reasons *

* Please give details _____

(b) What is the maximum number of does being milked in the 2000/01 season ?

(c) Please estimate the maximum number of does to be milked in the 2001/02 season?

(d) Please estimate the maximum number of does to be milked in the 2002/03season?

(e) Please estimate the number of kids to be raised in 2000/01 .

(f) **Kidding Pattern**

Using the following calendar, please give the number of expected kiddings in each month:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

3. PRODUCTION DETAILS

- (a) What was your peak daily herd production (in litres) in the 1999/00 year?
- (b) How much milk was sold to factories in the year 1/7/99 to 30/6/00 ?
- (c) How much milk was sold for other purposes in the year 1/7/99 to 30/6/00 ?
- (d) How much milk was used for other purposes (eg, fed to kids) in the year 1/7/99 to 30/6/00 ?
- TOTAL MILK PRODUCED (b + c + d) ...
- (e) To whom do you supply your milk ? _____
- (f) Please advise what milk test data, if any, you receive from your supplier.
 Fat Protein SNF Acidity Plate Count Antibiotics Sensory
 Other _____
- (g) If you process milk on farm, what products do you make ? _____

4. BREEDING DETAILS

- (a) Briefly describe your herd breeding objectives and priorities (eg, building numbers, increasing production, improving udders, lifting fat or protein %, increasing lactation length)

- (b) What features are you looking for in selection of bucks (or semen) ?

- (c) Do you keep records to identify progeny of bucks and does ? Yes No
- (d) Do you induce or synchronise oestrus ? Yes No
 If so, how ? _____
 If not, do you plan to ? Yes No
- (e) Please give your target ages and/or weights, if any, for weaning kids or joining maiden does.
 Weaning age Weaning weight
 Joining age Joining weight

Thank you for participating in this survey. Please use the return addressed/postage paid envelope provided to mail your response by October 30, 2000.

Appendix II: Goat Cheese Market Survey Reports– 1998/99, 2000

Survey Questionnaire (Retailers) - 2000

RURAL INDUSTRIES RESEARCH AND DEVELOPMENT CORPORATION

GOAT CHEESE MARKET SURVEY 1998-9

INTRODUCTION

In response to a lack of accurate market data on specialty goat cheese production, sales, imports and exports, a market survey was commenced to provide the industry with this information. Initially, the survey has concentrated on developing contacts in the various market segments and collecting both quantitative and qualitative data. It is intended to build on this bank of information with regular (up to quarterly) followup surveys.

SPECIALTY GOAT CHEESE PRODUCTION IN AUSTRALIA for 1998 was valued at \$3m (figures from the Australian Specialist Cheesemakers Association).

700,000 litres of goats milk were used in cheesemaking in Victoria in 1997-8. Production has been steadily increasing since before 1988.

Milk production continues to grow and for the first time one Victorian factory at least, appears to be fully supplied. As a result of this, milk is now being shipped to other areas. A company has been set up to market and distribute milk. This is proving effective in supply and promises greater efficiency and quality. Producers who are involved have shorter distances to travel, and can be co-ordinated so that milk is fresher to the factories. In future this may help to address seasonality of supply. Transport is by refrigerated container. This is an important step in industry development.

IMPORTS OF GOAT CHEESE for 1997-8 were

goat 57.8 tonnes value A\$598,214
kasseri 185.9 tonnes value A\$1,559,860
fetta 1298.6 tonnes value A\$6,908,405

Imports for the six months July-December 1998 were

goat 31.2 tonnes value A\$348,522
kasseri 44.96 tonnes value A\$377,487
fetta 485.03 tonnes value A\$3,194,625 (See Table 1)

It is unclear what milk is represented in fetta and kasseri. It will not be possible to sort this out, in fact there is pressure to reduce categories rather than expand them. Fetta and kasseri are subject to the same quota and tariff arrangements as is cows milk cheese, regardless of the species milk. The in-quota rate is A\$96 per tonne, and the quota volume is 11,500 tonnes. The out-of-quota rate is A\$2000 per tonne. The quota hasn't been breached in the last three years.

Goat cheese imports peaked in September-October and tailed off substantially in December-January. Overall growth has continued since 1988. Goat cheese is not subject to quota.

Fetta and kasseri peaked in September-October then again in December-January. Quantities have been more variable from year to year.

It should be noted that ABS (Australian Bureau of Statistics) and AQIS (Australian Quarantine and Inspection Service) provide information on a fee for service basis.

SURVEY REPORTS

Four areas were surveyed: delicatessens, supermarkets, restaurants and distributors/importers.

Survey forms were modified for each sector.

Results are summarised as far as possible at the end of each table.

Where responses appear inappropriate they do not appear in the table summaries.

Response

27 survey forms out of total 70 were returned.

Delis: 5 out of 11

Supermarkets: 5 out of 16

Restaurants: 10 out of 30

Distributors and Importers: 7 out of 13

Retail

Retail outlets surveyed were mostly in shopping complexes, from Maribyrnong through Moonee Ponds, Airport West, Greensborough, Heidelberg, Preston, Doncaster, Ringwood, Vermont, Cheltenham, and inner city areas.

Supermarkets

Supermarkets were visited and forms left with section managers. Head Offices were contacted by phone, and forms faxed or mailed out. 5 out of 16 supermarket stores and head offices responded by filling out the survey. **Most** personnel were unwilling to fill out forms, related to store policy. However many were willing to discuss the questions. This input was consistent with written responses.

There are two main, separate areas that sell cheese, one the deli counter that sells bulk as well as prepacked, the other the dairy/cheese section that sells only prepacked. They do not communicate. One store had a health food section which had some goat cheese marinated in oil. Completed survey forms were mostly from the dairy section.

Customers for goat cheese were generally female, from a range of age groups, and included ethnic customers, those with previous experience, experimental, 'yuppies' and upmarket shoppers, and customers with 'some ~~education~~ of the cheese was identified as Australian. However there were considerable quantities of imported chevre on display in some stores, and problems with fetta are discussed under 'Types'.

Quantities purchased averaged 200G per visit. Sales at individual stores were 20KG per week, and chain-wide up to 32000Kg per year. No peak season was noted.

One section manager stated they had no stock and that head office had deleted goat cheese from the range, but stock was actually there and head office has not deleted it.

Types stocked were fetta and chevres, and although 'blue' was listed by two stores, observation suggested this was a mistake. Fetta was the most popular, however as most respondents believed that all fetta is made from sheep or goats milk, this popularity may be overestimated.

Deli counters had displays of bulk fetta, including some goat fetta, usually identified with country of origin on a display tag. Brand names were rarely displayed. Sometimes the brand was on the sealing tape put on after wrapping, but it was insignificant and consumers would be unlikely to notice it.

There appears to be some inconsistency between the perceived type of milk in fetta, the source being given as Australian, and the visibility of imported fetta.

Preferred packaging was mostly for prepacked, and this was a prerequisite for the dairy, as distinct from the deli, section.

Main use of the cheese was not easily identified by supermarkets, but one felt it was table and another, cooking.

Preferred texture was fetta.

Limiting factors were customer knowledge and price, with availability and range of cheeses also mentioned.

Identifiability of goat cheeses was considered generally good and desirable.

Main suppliers have been listed in the table summaries but not in the tables, to protect confidentiality.

Information needed was across the range suggested; ie description of cheeses, storage hints, and shelf life, with recipes and serving suggestions being most popular.

Suggestions were for more consumer education on the benefits of goat cheeses, a bigger range available and for tastings.

Yoghurt was identified as a potential new product, and fresh milk was also mentioned.

Delis were also visited and forms left with managers.

5 out of 11 filled out the survey form. Most of these also discussed issues, and 2 who did not fill out the form, discussed the issues. As to be expected, response, product knowledge and interest was better.

Customers for goat cheese were usually female from a full range of age groups, and included the health and allergy conscious, trendy, traveller and European. Delis, and one distributor, were the only surveyed areas to identify health issues as relevant.

Source: there was a moderate preference for imported goat cheese, mainly due to perceived quality aspects and the source of supply/nature of the business. Familiarity and price were also mentioned.

Quantity used averaged 200G per visit. Sales were up to 100KG per year. No peak season was noted.

Types most sought after were chevre, plain or ashed etc, and fetta. Firm style imported cheeses, in particular Caprakas and Rosendal, were popular where these were available. Some outlets understood that all fetta is made from goat or sheep milk, and some were unaware of the range of goat cheeses available.

Packaging preference was strongly 'cut to requirements', because of customer preference and quality. Main use for the cheese was table, with some customers also using for cooking.

Preferred texture was for firm styles, followed by semifirm.

Limiting factors identified were knowledge and awareness. This was implied or stated to be customer knowledge, but outlets themselves often had little information. The lack of variety in goat cheeses and price were also issues.

Identifiability: local cheeses were readily identifiable, but some imported cheeses not so. Most respondents felt goat cheese should be easily identifiable.

Main suppliers included two local cheese factories, one local distributor and three importers.

Generally delis purchased cheese from suppliers of other goods, and appeared happy to stay with regular suppliers rather than deal with an extra distributor. Sometimes they were unaware that their regular supplier also carried some other lines.

Demand was felt to be steady or increasing.

More information would be welcomed by all, in particular a description of the cheeses, information on shelf life, on storage, and recipes. They were generally keen to have more promotion, as an idea; however cited problems of space when handout material is available.

Problems and suggestions identified variable quality and lack of consistent supply in Australian cheeses. The need for firm style cheese was also mentioned. One outlet requested tastings but noted that although his sales had been very good at a tasting, subsequent sales had not improved.

Yoghurt was seen as a promising development area by one, and several requested supply or increased supply of goat fetta. One respondent felt strongly that no new products were needed.

Restaurants

10 out of 30 returned the survey form.

Sourced from The Age Good Food Guide, across districts at random but avoiding Asian establishments.

All were contacted by phone and the survey form faxed or posted.

Most use goat cheese at least at times. There was some ignorance of fetta relating to milk type.

Customers for goat cheese were of both sexes, usually middleaged, and with an interest in food.

Europeans were also mentioned specifically.

Source of the cheese preferred by restaurants was Australian. Reasons for this were usually not stated. One respondent stated (he) would use imported in preference if it were unpasteurised, another that it depended on the style. On the other hand, users of imported cheese all had clear reasons for their choice; for example that it was sometimes cheaper, had more variety, had stronger goat flavour, or had bigger depth.

Quantities used averaged 1-3 KG per week. One restaurant surveyed is not using goat cheese at present. Peak usage times were varied; in warmer weather, November-December, according to the menu, or none. Types used were predominantly plain chevre, although other chevre, fetta and frais, and some blue, were also in stock.

Preferred packaging was vacuum packaging because of keeping qualities. Several mentioned waxed paper.

Main use in restaurants is in cooking.

Most preferred texture was semifirm, then soft light.

Limiting factors were customer preference and familiarity, with several specifically stating that customers dislike goat cheese. One respondent stated there were no limiting factors and acceptance was high.

Identifiability of goat cheese was considered to be 100%. One respondent felt it should not be identifiable. He had already indicated that his customers didn't like goat cheese.

Main suppliers are local importers/distributors and cheesemakers.

Demand is steady, with some growth tendency.

More information would be welcome in the form of description of cheeses, also some interest was shown in shelf life and storage hints, and versatility of the cheeses. A poster showing cheese types was suggested.

Problems were variability during the year, and complaints that it splits.

Yoghurt was seen as a potential new product.

Icecream was seen to have some potential.

Distributors and Importers

7 out of 13 returned the survey form.

Sourced from other respondents. All were contacted by phone and survey forms mailed or faxed.

Customers were mostly food service. Supermarkets and delis were also mentioned.

Source was mostly Australian. One supplies imports as well, stating that some customers prefer imported flavour and quality consistency. Another is an import business only.

Quantities used ranged from 200 G per week to 26 tonne per year. Most noted no peak demand times, but several identified summer.

Types stocked were wide ranging, the most used being plain chevre followed by other chevre and fetta. 'Buchette' as described by one importer, is a chevre log.

Preferred packaging strongly favoured vacuum packing, citing manageability, shelf life, and easier sales.

Main use was identified as table by most, however the most specific reply stated 10% table and 90% cooking.

Preferred texture was semifirm, followed by soft light and fetta.

Limiting factors were quality, with complaints about wet and crumbly texture; price, in particular in relation to cow fetta; flavour; and customer awareness. Availability was also mentioned.

Identifiability was considered good, and desirable.

Main suppliers were Australian. One firm dealt in both local and imports.

Demand is seen as steady or growing.

More information would be welcomed by most distributors, in particular description of cheeses and storage hints.

Recipes and nutritional information were also mentioned.

Problems were quality and availability.

Suggestions were for consumer education on the benefits of goat cheese, and for a hard style to be available.

Yoghurt was identified as having potential by one respondent, but three others stated specifically that it did not.

General Comments on the Survey

Main customers: gourmet-trendy 13, ethnic 4, health 1, other 2.

The small number identified in the 'ethnic' sector is probably related to the reluctance of many outlets in 'ethnic' areas, to formally participate in the survey, although verbal response was better.

Health shops may well have identified more health conscious customers, but although many health food shops were visited in shopping centres, none had any cheese stock so were not formally surveyed. They were sometimes aware that fresh milk and yoghurt might be available, but were not enthusiastic about it, citing poor supply and demand; 'people don't like it'. Some had stocked goat cheeses in the past but reported low demand. Health food shops are not usually supplied by the main distributors.

Source of cheese: Australian 19, imports 9. Issues were: quality 5, price 2, familiarity 1, supply source/orientation of business 4, variety 1.

Most appeared not to have had wide exposure to a variety of local and imported cheeses. Goodwill towards Australian cheeses is widespread. One specialist import retail outlet stated 'we sell some Australian too', although none was visible.

Some delis stocked mild flavoured, firm style wheels of Dutch and Norwegian origin. There appears to be a market here for similar local styles, although one that was available some years ago did not do well. Note that product knowledge and distribution has improved since then.

Some supermarkets had large stocks of both local and French chevre side by side. The French prices were well below local, the flavour was mild and texture creamy.

Peak Usage: Restaurants and wholesalers identified a slightly higher use in warmer weather. Retail outlets did not.

Types used: fetta 21, plain chevre 20, frais 9, other chevre 18, white rind 5, blue 8, other 6 (4 firm varieties).

Most used: fetta 4, plain chevre 12.

At times respondents seemed to forget the survey was of goat cheese, having already claimed use then later suggesting that goat fetta should be available. Face to face data collection indicated that interviewees did sometimes include other specialty cheeses in answers.

Preferred packaging: delis mostly cut to requirements, all other sources mostly prepackaged. No dissatisfaction was expressed and users seem able to get the packaging they want.

Individual manufacturers may find it useful to consider packaging preferences as expressed in the survey, and the reasons given for these in several areas.

Main use: table 17, cooking 16, restaurants main users for cooking (9).

Some retailers felt that usage would increase if more were used in cooking, and that recipes would help.

Preferred texture: soft light 6 (restaurants 4), semifirm 10 (rest.5), firm 4 (rest.0), fetta 7 (supermarkets 3).

Limiting factors/problems and suggestions: product knowledge 8, lack of range 5, price 6, availability 4, customer preference 7, quality 6.

Product knowledge and lack of range together indicate a need for promotion, as there is a greater range available than many are aware of. Customer preference may come into play here, as customers/suppliers often do not understand that different styles are available. There is a general need to identify and describe cheeses.

See also 'More Information' comments below..

Quality involved flavour and texture.

Several issues were identified, indicating differences of preference for mild or strong flavour. Crumbliness or a tendency for the cheese to split was considered undesirable. However, some characteristics that have been identified as 'quality' issues may perhaps be described as 'range' or 'consumer education' issues. For example, a stronger flavour is preferred by some, and some crumbliness is characteristic of fetta. It is clear that some consumers at least, are unaware of varieties. This could be addressed through information/range as above, as we know there is a range available. Nevertheless quality issues are deeper than this; variability and undesirable texture for example. It is clear that some customers are not getting what they want.

Availability should improve as supply increases and evens out over the year.

Demand: growing 9, steady 16, decreasing 1.

This indicates room for expansion even without attempts to address specific market needs. However the presence of good quality cheap imports appearing in all outlets should be noted.

More information needed: description of cheeses 21, storage hints 13, shelf life 12, recipes/serving suggestions 8, posters 1, nutritional 1.

Suggestions not included above: tastings 2. Note that one response suggests that tastings may have a transitory effect. There may well be a nonspecific cumulative benefit in the longer term.

Potential for new products: yoghurt 12 (restaurants 7), icecream 3 (restaurants 2), fresh milk 1 (supermarket).

CONCLUSIONS

1. There is an established and steadily expanding market for goat cheese in Victoria. Food service and increasingly supermarkets are the biggest customers.
2. Knowledge about goat cheese is very limited, both about what actually is goat cheese and its various styles and characteristics.
Some respondents seemed to confuse goat cheese with other specialty cheeses.
It seems likely that some who identified use of 'white rind' meant plain chevre. Certainly 'blue' was not available in some supermarkets that listed it.
Strong goat flavour was identified as a problem for most users, but occasionally as a desirable characteristic.
There is very widespread misunderstanding of milk source for fetta.
3. Quality issues and perceived value for money need to be addressed. These are longstanding issues. 'Import replacement is limited by relatively expensive and poor quality local produce....Price premiums (for cheese) appear to be unjustified for the quality of local produce.' Susan Young, 'An Assessment of Production & Marketing of Goat Cheeses & Milk in Victoria' 1989, ISSN 0817-1157, Agdex 417/840.
4. Several respondents noted a lack of variety. This was puzzling considering what's available, but it may be related to particular distributors having a limited range, or their customers being unaware of the full range. Given that many outlets are unwilling to deal with multiple suppliers, perhaps distributors need to increase their range.
5. Identification and accurate labelling of particular cheeses with regard to flavour and texture is needed. Information on the range available is needed. Extension of usage in cooking would assist the retail end, and recipes would be helpful here.
6. It was noted that imported product is a real or potential threat. The exchange rate is a factor. Cheeses sourced from Greece or Balkan areas, ie fetta, may be more price sensitive, and the perception/reality of quality/value for money operates. Australian chevre styles are potentially vulnerable to imports which are increasingly visible. However the trend in supermarket sales (see attachment 6) indicates that Australian volume is increasing and prices decreasing.
7. At market level there appears to be considerable opportunity for information and promotion of the range of local goat cheeses across many sectors of the food industry and for expansion of the range. It may be useful to promote goat cheese as a 'summertime' cheese.
8. At farmer/cheesemaker level improvements in availability, quality and price are being investigated, and results need to be disseminated.

RECOMMENDATIONS

1. An educational campaign should be started, directed at distribution, retail and restaurant staff in particular, aimed at increasing understanding of the variety of cheeses available, and their potential uses. ASCA, with its member resources in the food industry, could instigate this.
2. A common 'language' to describe cheese types should be developed and used on packaging and in promotions. ASCA and nonmember cheesemakers could liaise to develop this.
3. Research should be undertaken to ascertain the factors involved in Australian cheese prices being higher than those of imports, and how to address these.
4. Quality issues could be investigated in more depth by individual cheesemakers or ASCA, or an extension of this survey.
5. Use of the internet for marketing, information and sales should be investigated. A site could be shared between cheesemakers and links established with other specialist food sites.

Table 1 IMPORTS OF GOAT CHEESE, FETTA AND KASSERI (tonnes)

PRODUCT	PRODCODE	COUNTRY	92/3	93/4	94/5	95/6	96/7	97/8	98 <u>Jul/Dec</u>
Fetta	406909030	Bulgaria	459.9	649.7	637.8	554.0	688.7	609.8	189.7
		Denmark	165.1	189.8	200.9	210.4	352.3	113.8	24.7
		Egypt	2.0	3.3		0.7	1.4		
		France				0.7	0.6	1.1	
		Germany	1.5	0.9	16.0				
		Greece	384.1	472.2	500.7	504.1	544.1	486.7	231.4
		Italy	13.9						
		Netherlands					3.2		
		New Zealand	37.1	51.0	71.8	71	18.2	30.1	28.4
		Romania				82.5	167.1	40.9	10.8
		Switzerland	1.1						
		Syria				0.1	1.6		
		Belgium-Luxembourg						16.1	
			1050.8	1380.7	1427.1	1424.0	1777.2	1298.6	(485.0)
Goat	46901017	Belgium						0.7	
		Bulgaria						4.4	
		France	25.0	23.8	22.6	14.2	23.1	29.4	16.2
		Netherlands	4.7	3.9	2.7	3.7	7.5	6.7	3.4
		New Zealand	0.2	0.1					
		Norway	13.4	10.8	19.9	13.5	14.4	13.9	6.8
		UK	0.5	0.3					
		USA					3.1	3.5	0.3
		Denmark						3.1	
		Greece						0.7	2.4
		Spain						0.5	1.0
			43.8	38.9	45.3	31.4	53.3	57.8	(31.2)
Kasseri	406909023	Germany	0.5				0.2		
		Greece	132.1	202.7	223.2	155.9	193.0	185.9	21.5
		Hungary			23.5	3.6	21.3	24.9	20.5
		Romania				12.9		3.0	
		Bulgaria							2.9
			132.6	202.7	223.2	155.9	193.0	185.9	(45.0)

Rural Industries Research & Development Corporation

Goat Cheese Market Survey 2000

1. INTRODUCTION

This survey follows on from the initial RIRDC market survey of goat cheese in Victoria, carried out in 1998-9.

There has been a lack of accurate market data on specialty goat cheese production, sales, and imports, and these surveys are intended to provide this information.

Both quantitative and qualitative information has been sought, over a wide range of informants.

It has been important to balance the importance of frequent updates of information, and creating 'survey weariness' in participants.

2. SPECIALTY GOAT CHEESE PRODUCTION IN AUSTRALIA

Production for 1999 was valued at \$3.2m (figures from the Australian Specialist Cheesemakers' Association).

1,168,000 litres of goats milk were used in 1999-2000 for cheesemaking in Victoria, and 320,000 litres in Tasmania. Production has been steadily increasing since 1988. (See Fig 1)

Some factories are directly supplied by farms, several have on-farm operations, and some get all or part of their milk supply from a distribution company operating from the Wodonga area.

Seasonality of milk supply has been addressed with varying success. An incentive is paid for winter milk by a few buyers but the true cost of out-of-season supply has not been established. A severe winter in the north of Victoria and some management problems led to poor winter supply in 2000. However this seasonality does not now appear to translate to supply problems in the cheese marketplace (see Conclusions).

Factories are fully supplied and there is a milk surplus. Some of this has been absorbed by cheesemakers, some of whom report wastage of surplus product (in excess of 4.5 tonne or 35,000 litres); some has been used on-farm for kid raising and some has been discarded; estimates of 100,000 litres have been made. Efforts have been made since October 1999 to explore export markets for goat milk products, and to access processing (especially drying) facilities for milk. Discussions have been held with a number of interested buyers, but processing on a suitable scale remains a problem. Plant used for cows milk products cannot handle small quantities. It is likely that specialised facilities will be available next year.

A joint RIRDC-NRE project was set up at that time to survey potential Asian markets for cheese and other products such as milk powder, and useful information has been collated.

3. IMPORTS OF GOAT CHEESE:

Figures for 1999-2000 were available for six months only, due to changes in product codes during the period.

Between January-June 2000: goat 27 tonnes value A\$258,925 (A\$9.65/kg).

Adjusted figures 1999-2000: goat 54 tonnes, value A\$517,850. This is a decrease from an estimated 61 tonnes for the previous year (see Table 2), however this is not an unusual variation, and also the period excludes the September-October peak.

Fetta & kasseri: The common perception is that these cheeses are always made from goat or sheep milk; however it appears unlikely on the basis of price and also the lack of any specific claims made, that much goats milk is involved. Consequently import figures for these have not been included. Attachment 6 which lists supermarket sales of goat cheese Australia-wide, notes specific goat fetta.

It should be noted that ABS (Australian Bureau of Statistics) and AQIS (Australian Quarantine Inspection Service) provide information on a fee for service basis.

4. SURVEY REPORTS

Once again four areas in Victoria were surveyed: delicatessens, supermarkets, restaurants and distributors/importers.

Survey forms were modified for each sector, and revised from those used previously, in consultation with the sector involved.

Results are summarised as far as possible at the end of each table.

Comparisons with the previous survey have been made, but these should be treated with caution as many respondents were not involved in both surveys.

Response

18 forms out of a total 37 were returned.

Delis: 5 out of 8

Supermarkets: 2 out of 6

Restaurants: 7 out of 14

Distributors and importers: 4 out of 9

4.1 Retail

Significant differences from the previous survey are mentioned under specific headings.

Health food stores 5 were visited but none stocked goat cheese. There was mild interest from 3 and none from 2.

Delis 5 out of 8 completed forms.

Most of these discussed issues as well as filling out the form. They were in shopping complexes or strips in the north, north-eastern and eastern suburbs, inner city and one country area.

Some deli outlets in shopping complexes had closed since the last survey. Those still operating appeared to be thriving, and all those visited had some stock of goat cheese..

Most had no idea of other goat cheeses that were available, including some made by cheesemakers whose product they stocked. Some had lost some lines by the disappearance of their distributor or sales person.

Most of the respondents were new so comparisons with the previous survey should be treated with caution.

Main customers came from a wide range of ages, from students up, and mostly over 25. They were described as 'adventurous eaters'. Health consciousness and ethnicity were not given as reasons this time.

Source of cheese: Predominantly Australian, also both Australian and imported. Some hard cheese was imported, with the outlets unaware of Australian styles available. This was partly related to what their distributor/s offered.

The previous survey showed a moderate preference for imported, due partly to quality aspects, which were not mentioned this time.

Quantity Usual 1-3 kg/week. This appears to be up on last survey but variations in how the question was answered make it hard to judge in this context.

Types A wide range was stocked, with plain chevre (3) hard/mature (2) and marinated (1) the most popular. In the deli sector, the fetta was clearly identified as goat fetta.

The marinated fetta is new and well liked. Previously some outlets had mentioned the need for a hard style cheese. This is now available as a local product but needs to be more widely known. One imported hard cheese has recently become unavailable.

Packaging mostly according to type, eg is fetta commonly cut to order and chevre prepacked. Two preferred cut to order. Outlets were generally happy with the current situation except for one which accepted prepacked for keeping qualities but said it was 'not ideal'.

Usage About equal, with cooking slightly more popular than last survey.

Expectations of taste and texture: Mild (2), depends on customer (1), don't know (1), 'enjoyable'(1).

Price barrier? Some didn't answer this, two felt there was no price barrier, and one did.

Discounting? One deli would give a discount if a whole wheel was purchased.

Wastage none

Brands; consistency, availability: no comments.

Brands; popularity Meredith mentioned by 2, Milawa by 1, 2 had noted no preference. Most were unaware of brands that they did not stock. Distributors appeared to be the key and those who handled other products into the stores were the ones who placed cheeses there.

Seasonality no problems, though previously 1 noted lack of consistent supply and variable quality.

Limiting factors Taste (3), and knowledge (2), which included staff knowledge.

Main suppliers. Cheese factories (5), local distributors (4) importers (2), local/importers (2).

Demand Similar to the last survey, mostly steady, with a tendency to increased demand.

More info? Once again, description of the cheeses, followed closely by recipes, then shelf life, storage hints, tastings and information on ingredients eg the type of rennet.

Problems/suggestions: The need to educate staff and customers was felt strongly by 3. Neither staff nor customers know what's available, and need guidance to explore cheeses. Marketing was generally felt to be poor.

Supermarkets

See Table 3 for supermarket sales of goat cheese by volume, value and price. These are Australia-wide figures. Head office buyers were contacted by phone and forms faxed. Local stores were not extensively surveyed because of head office policy that stores not be involved in surveys. However stores were visited and stock noted in 5 stores not formally surveyed. Independent stores were visited and forms left with managers. Most smaller supermarkets do not stock goat cheese, and these were not included.

One head office and one local premises responded, and several others were willing to discuss questions. This input was consistent with written responses.

Fetta is thought by most people to be always made from goats milk, as mentioned above, so responses that mention fetta should be treated with caution.

Larger stores had a dairy section that sells only prepacked cheeses, and a deli section that sells prepacked and bulk. Several stores had health food sections, and one of these had goat cheese.

Customers for goat cheese were female, all ages, where prepacked cheese was sold, and from ethnic background where bulk was sold. 'Upmarket' shoppers were not mentioned this time.

Source of the cheese was described as Australian. However there were quantities of imported chevre on display in some stores, and much of the fetta observed in stores was not Australian. It was commonly identified with country of origin, and less frequently by brand. Once again there is inconsistency between the visibility of imported cheese, and the response to the question of source.

Quantities purchased from the IGA store were 100G/week, and by the chain \$101,000/year.

Types By the IGA store, plain and other chevre; by the chain, fetta.

Preferred packaging depended on the cheese stocked, chevres being always prepacked and fetta usually cut to order. Prepacked is a requirement for the dairy (as distinct from the deli) section.

Main use of the cheese is not easily identified by supermarkets. 'Table' and 'cooking' were both indicated.

Expectations of taste and texture were not indicated.

Price barrier was not indicated. High price was mentioned last time.

Discounting and wastage were not issues.

Brands were not indicated.

Seasonality and Limiting factors were not indicated.

Main supplier These have been listed in the table summaries but not in the tables, to protect confidentiality.

Demand steady, though the IGA store had only been stocking product for a year.

More information: description of the cheeses and recipes, and less for storage.

4.2 Restaurants

7 out of 14 returned the survey form.

These were sourced from The Age Good Food Guide across districts at random, also with reference to last survey's respondents. Asian establishments where usage is unlikely, were not contacted. All were contacted by phone and forms faxed.

Care should be taken with comparisons as mentioned above.

Significant differences from the previous survey are mentioned.

Main customers 'Upmarket' (4), a wide range (2). None identified 'wide range' last year.

Imported/Australian: Predominantly Australian, imported (1), 'depends' (1). The user of imported cheese preferred its taste.

Quantity 18-200kg/year, 4 used 100kg/year, 2 less, 1 more.

Last time, 6 used 50kg/year, 2 less, 2 more.

Types used Plain chevre (7), other chevre (4), blue (3), white rind (2), fetta (2), washed rind (2), frais (1).

Most Plain chevre (5), herbed chevre (1).

Packaging Mostly prepacked, one cut (acc/to type), and one not packaged. I suspect this means it came wrapped.

Reasons for prepacked: Shelf life/freshness (5), unit control (1), easy storage (1).

for no package: taste, also no reason given, which elsewhere has indicated 'how it comes'.

Problems with packaging: no.

Used twice as much for cooking as table.

Expectations Taste: Replies ranged from 'slightly tangy', 'not too strong', 'goat', 'strong'.

Texture: creamy (2), light (1), not too crumbly (1).

Price barrier? Most felt there is none, one identified \$25/kg, one said that French chevre is cheaper.

Wastage none.

Brands consistency, availability, popularity: identified as vital points by one user, another mentioned Milawa.

Seasonality no problem. Last survey there was a comment that it 'varies in months'.

Limiting factors Customer willingness to try.

Main supplier/s Australian Cheese Shop, Butterfields, Kytren, Meribel, Milawa, Simon Johnson, Tarago River.

Demand One said demand was falling, the others that it was steady. Two identified growth last time.

More information? Most wanted description of the cheeses, also storage hints, shelf life, recipes, nutritional value, and reasons to use goat cheese as distinct from cows cheese.

Problems/suggestions One wanted a supplier who could help with problems, one felt a need for a St Maure type for platters. Variability and texture not identified as problems this time.

4.3 Distributors

4 out of 9 returned the survey.

Sourced from other respondents and from previous contact.

Customers Food service remains the biggest outlet, and retail. Also health conscious, aged 25-35yo were

Identified Australian. Importers responded poorly to this survey.

Quantities 15-1800kg/year/customer. The largest last survey was 26 tonne/year.

Types A wide range handled, with fetta & chevre the most used.

Preferred packaging Two handled prepackaged cheese for customer preference, ease of handling and shelf life; and one cut to order. Comments were 'Depends on type of cheese and end market.' 'How it comes.'

Problems with packaging Not seen as a problem, and distributors appeared happy to accept whatever is provided by makers.

Main use Table (3), cooking (2).

Expectations Taste: range from 'goat', 'mild', 'clean'.

Texture: creamy or smooth (3), crumbly (1), firm (1). Note that traditional fetta can be described as firm/crumbly. Other fetta in the more gourmet market does not have this consistency.

Price barrier? Mostly not answered. From previous information, the traditional market appears more price

Discouraging? Not identified.

Wastage? No.

Brands: Consistency, availability, popularity and other not identified.

Seasonality? Not a problem. One respondent noted that larger cheesemakers stockpile over shortfalls of milk supply.

Last survey: changes due to season noted by one.

Limiting factors varied, taste, acceptance which may be the same thing, price, variety, usages. The price factor is noted by a supplier into small supermarkets. Quality and supply not identified as issues this year.

Main supplier Australian. This may have more to do with respondents than reality.

Demand Steady (2), increasing (2).

More info? Description, recipes, storage, shelf life, and availability of goats milk all identified as desirable by 1 supplier, and another identified description and recipes.

Problems/suggestions One supplier identified a need for a firm chalky cheese like a French variety, and also noted that cheesemakers do themselves a disservice by packaging under another company's label.

Last survey: Quality (2), supply (2), variety (1), health benefits (1). See 'limiting factors' above.

5. GENERAL COMMENTS ON THE SURVEY

Note that not all respondents answered all questions.

Main customer Most customers were identified as in the age range students-40 years old. They were also described as 'diverse' by 2 respondents, upmarket/higher income by 2, adventurous eaters by 1, and health conscious by 1.

Customers were not so widely identified as 'upmarket' by respondents this time. However goat cheese, except for some bulk fetta, is not commonly found outside the more affluent areas.

Health food shops still do not have stocks of goat cheese, as commented in the last survey.

Source of cheese Australian was sometimes mentioned even when imported was the more visible. Only one (a chef) preferred imported, for taste; another chef commented it depended on what was being served. There is a quantity of French chevre available at a considerably lower price than local product, in several large chains, some being supplied through an Australian specialty cheese factory with links overseas. A popular Norwegian firm cheese is no longer available, and there should be an opportunity for local product to fill the gap.

Demand Was described as growing by 4 respondents, steady by 14, down by 1. Last survey showed growing 9, steady 16, down 1. Distributors are seeing the most growth. This seems to suggest more outlets, as retail and restaurants tended to identify stable use.

Types used There are two styles of or markets for fetta: first the traditional Greek, where the type of milk is unspecified but assumed by outlets to be goat or sheep; and secondly the gourmet, where new product that is specifically made from goats milk is appearing, often value-added eg marinated. The two styles do not usually appear in the same outlets.

Responses indicated plain chevre (14), fetta (11). Fetta is well below chevre usage in restaurants and delis, but up in supermarkets. Other chevre (12), hard (6), blue (6), white rind (6), washed rind (4).

Preferred packaging Surprisingly, considering the difficulties that can be experienced opening cryovac, there have been no complaints about this. Packaging is related to the type of cheese, with traditional fetta often coming in buckets, hard cheese wheels cut to order, and softer cheeses in cryovac. Cryovac is appreciated for its ease of handling and extension of shelf life. It is disliked by a few because it doesn't allow the cheese to 'breathe' or mature naturally. One local company uses 'click' plastic boxes which are easy to use, but nobody commented on this packaging.

Main use Table use was identified as the main use by 12, and cooking by 13. A distributor suggested a 30%-70% ratio of table to cooking, with regard to quantity used. Broad figures are similar to the previous survey. Cooking would appear to offer considerably expanded use, and recipes are requested by retail outlets.

Expectations of taste and texture are remarkably varied, ranging from mild to strong. A smooth creamy consistency is generally considered important. 'Expectation' of taste etc. may not be the best way to ask this question, as it may not necessarily indicate preference. Once again the need for outlet and consumer education is indicated, with information on what a particular cheese will be like.

Seasonality of milk supply has been identified as a problem for cheesemakers, however it is not a problem for retailers or restaurants. One distributor noted it is not a problem with regard to supply from larger cheesemakers, who stockpile. The related questions regarding consistency and availability have identified no problem either.

The previous survey did identify some problems in these areas.

Limiting factors Product knowledge and willingness to try (6), taste (3), price (1), variety (1). This differs considerably in some areas from the previous survey: product knowledge (8), lack of range (5), price (6), availability (4), customer preference (7), quality (6).

Price, quality, lack of range and availability appear to be much less important this time, although lack of range was identified verbally by some retailers, and the section 'Product knowledge' may include issues such as lack of range. See 'More information?' section.

The price issue should be monitored carefully in view of the cheapness of imports.

Quality issues, in particular variability and undesirable texture were identified as problems in the last survey, when it was clear that some customers were not getting what they wanted. They were not issues this time.

More information? Description of cheeses (13), recipes (9), storage hints (6), shelf life (6). These were mostly from the retail sector, but restaurants were predominantly interested in description of cheeses.

Problems and suggestions. 'Product knowledge', 'willingness to try', 'taste' and 'variety' responses in 'Limiting factors' underline the requests for information in this section. There is a greater range available than many are aware of, and this indicates a need for promotion. There is a general need to identify and describe cheeses.

Other suggestions The need for a St Maure style cheese was mentioned by two respondents.

One restaurant indicated the need for a supplier who could help with problems.

It was suggested that cheesemakers who package under a label not their own, do themselves a disservice.

Nutritional value, and reasons to use goat rather than cow cheeses, was requested by one.

6. CONCLUSIONS

- 6.1 There is an established market for goat cheese in Victoria. Food service and supermarkets are the biggest customers.
- 6.2 The trend appears to be for wider use. The survey identified more 'widespread' range of customers, where the previous survey identified more 'upmarket' customers.
- 6.3 Sales were generally described as 'steady', as for last survey, but two distributors identified increased usage. This seems to suggest more outlets.
- 6.4 Quality issues are linked to consumer expectations and are difficult to objectively quantify. There were no complaints about quality in this survey. 'Smooth and creamy' is a fairly constant ideal.
- 6.5 Seasonal shortages were not an issue in this survey, probably due to cheesemakers' ability to stockpile.
- 6.6 Knowledge about goat cheeses remains limited. Flavour expectations vary between customers and they have only experience to guide them in selection.
- 6.7 Some retailers (verbally) mentioned lack of variety, but on further discussion it was found that they were unaware of many varieties that are available from their current distributor/s. Also some distributors have a limited range. Promotion is essential, linked with information as above.
- 6.8 Gaps in the market can occur as has happened recently with a Norwegian hard cheese being no longer available, and retailers were unaware of the local product.
- 6.9 Extension of use in cooking would assist the retail end, and recipes were request.
- 6.10 There appears to be considerable opportunity for information and promotion of the range of goat cheeses across many sectors of the food industry and perhaps for expansion of the range.
- 6.12 Imported product poses real and potential problems, although the exchange rate has been a positive factor. Fetta suffers most from import competition, and related to this is the continuing problem of the source of milk in fetta (an issue of international interest at the present: pers.comment J.Crow, Dairytech). Chevre imports remain a potential threat. See Attachment 6 for supermarket sales.
- 6.13 Health issues are a minor consideration but do come up. Information is needed here too.
- 6.14 At farmer/cheesemaker level, availability and quality issues identified last survey appear to have been addressed (see above, 5 & 6) as far as the cheese marketplace is concerned. The issue of stockpiling is one that cheesemakers need to pursue with farmers, and costings for out of season milk should be established. It has been demonstrated that out of season kidding is feasible in Victoria under pasture based systems.

7. RECOMMENDATIONS

- 7.1 An educational campaign is needed. At retail level, description of cheeses, recipes and serving suggestions, storage hints, shelf life, nutritional and other information is required. Printed material and display systems should be provided. Well-known chefs should be approached to participate. Restaurants would welcome description of cheeses. Some distributors would welcome the range of information.
- 7.2 The ADC should promote the results of the ASCA Cheese Show, of which it is a sponsor. Goat cheeses do well there.
- 7.3 Invitations to the ASCA Cheese Show should be issued for Market Survey participants, and perhaps a free entry could be offered for one or more participants in the future, as an incentive to fill out the
- 7.4 identification and labeling of particular cheeses with regard to flavour and texture (and related to this, maturing and shelf life) is needed.
- 7.5 There may be opportunities for new style cheeses, but the market size for these may be small.
- 7.6 A common 'language' related to the above should be developed; cf meat 'language' used by Meat & Livestock Australia.
- 7.7 The source of milk in imported fetta should be investigated.
- 7.8 Monitoring of price issues and price importance in the marketplace.
- 7.9 Use of the Internet for promotion and ordering/sales, perhaps by a distributor, or a group formed for the purpose.

Fig 1

Goats Milk Production for Cheesemaking in Victoria

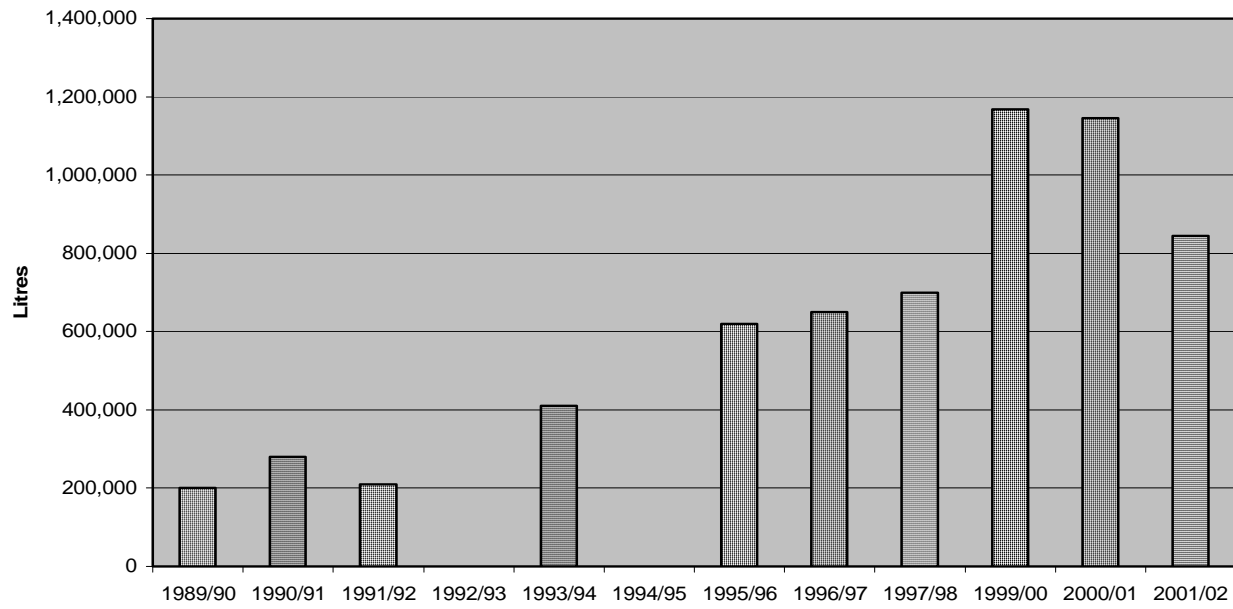


Table 2

Goat Cheese Imports				
FY	PRODUCT	Tonnes	Value (\$A)	A\$/kg
89/90	Goat	9	85,327	9.95
90/91	Goat	23	234,506	10.01
91/92	Goat	37	356,459	9.69
92/93	Goat	44	444,168	10.14
93/94	Goat	39	394,782	10.14
94/95	Goat	45	412,500	9.10
95/96	Goat	31	301,052	9.58
96/97	Goat	53	398,153	7.47
97/98	Goat	58	598,214	10.36
98/99	Goat	31	348,522	11.17
July-Dec		(62)	(697,044)	
98 only				
99/00	Goat	27	258,925	9.65
Jan-June		(54)	(517,850)	
2000 only				

Volume (tonnes)											
Country	89/90	90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99	99/00
Belgium-Luxembourg									1		
Bulgaria								4			
Denmark									3		
France	6	13	20	25	24	23	14	23	29	16	12
Germany		0									
Greece		1	4						1	2	1
Italy		1									
Netherlands		0	4	5	4	3	4	6	7	3	2
New Zealand	1		0	0	0		0		0		
Norway	1	7	8	13	11	20	14	14	14	7	11
Spain					0					1	
Sweden	0										
United Kingdom	0		0	1	0					1	
United States of America								3	3	0	
Total	9	23	37	44	39	45	31	53	58	31	27

Value (\$A)											
Country	89/90	90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99	99/00
Belgium-Luxembourg								3189			
Bulgaria								12381			
Denmark									32857.52		
France	77282	174192	248823	314951	307745	289983	195904	215804	391339.1	217534.5	135886.2
Germany		3703									
Greece		10103	27899						5226.02	20788.24	10243.83
Italy		8161									
Netherlands		1793	33467	44330	28371	22566	34366	68074	63871.5	38452.81	22442.36
New Zealand	2879		702	2515	810		109		113.41		
Norway	4513	36554	47053	73956	51479	99961	70673	70662	69057.83	38953.38	90372.29
Spain					116				4942.58	14922.01	
Sweden	587										
United Kingdom	206		515	8518	6261					14464.07	
United States of America								28043	30805.76	3407.13	

Price (A\$/kg)											
Country	89/90	90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99	99/00
Belgium-Luxembourg									\$4.43		
Bulgaria									\$2.79		
Denmark									\$10.53		
France	\$12.23	\$13.36	\$12.19	\$12.60	\$12.94	\$12.81	\$13.76	\$9.36	\$13.32	\$13.42	\$11.05
Germany		\$8.99									
Greece		\$7.50	\$8.43						\$8.04	\$8.85	\$7.16
Italy		\$8.51									
Netherlands		\$4.99	\$8.72	\$9.43	\$7.30	\$8.26	\$9.36	\$9.02	\$9.51	\$11.32	\$8.33
New Zealand	\$2.66		\$9.49	\$16.02	\$11.25	#VALUE!	\$27.25		\$10.44		
Norway	\$4.18	\$5.00	\$5.72	\$5.51	\$4.75	\$5.01	\$5.23	\$4.90	\$4.97	\$5.77	\$8.44
Spain					\$58.00				\$9.42	\$14.44	
Sweden	\$5.02										
United Kingdom	\$4.75		\$13.55	\$16.10	\$18.15					\$12.73	
United States of America								\$9.07	\$8.90	\$10.02	

Table 3 Supermarket Sales of Goat Cheese by Volume, Value & Price

		Volume (Tonnes)		
CountryName	VarietyName	9/11/97 - 01/11/98	02/11/98 - 31/10/99	01/11/99 - 29/10/00
Australian	Goat Fetta	12.882	18.106	31.44
Australian	Other Goat Cheese Varieties	26.578	37.041	34.288
New Zealand	Other Goat Cheese Varieties	0.018	0.012	0.009
Other	Goat Fetta	0.025	0.947	2.131
Other	Other Goat Cheese Varieties	12.887	13.289	11.217

		Value (\$ '000)		
CountryName	VarietyName	9/11/97 - 01/11/98	02/11/98 - 31/10/99	01/11/99 - 29/10/00
Australian	Goat Fetta	173.794	354.745	378.719
Australian	Other Goat Cheese Varieties	896.209	1962.775	1296.392
New Zealand	Other Goat Cheese Varieties	0.451	0.207	0.138
Other	Goat Fetta	10.021	16.101	34.583
Other	Other Goat Cheese Varieties	294.873	238.319	287.109

		Price (\$ '000)		
CountryName	VarietyName	9/11/97 - 01/11/98	02/11/98 - 31/10/99	01/11/99 - 29/10/00
Australian	Goat Fetta	13.51	17.38	11.90
Australian	Other Goat Cheese Varieties	31.38	28.89	37.81
New Zealand	Other Goat Cheese Varieties	25.00	17.25	15.33
Other	Goat Fetta	16.99	17.00	16.22
Other	Other Goat Cheese Varieties	15.50	17.96	23.81

CURRENT LISTING OF GOAT CHEESE PRODUCTS SOLD IN SUPERMARKETS

DESCRIPTION	COUNTRY
BUTTERFIELDS GOATS COUTOURIER	R/W O
SOUTHCAPE GOAT 150GM SW	A
WOOLWORTHS COTTAGE GOAT CHEVRE 200GM	A
WOOLWORTHS COTTAGE GOAT PLAIN 200GM	A
GIMERE GOAT CHEESE DUTCH	R/W O
ATTIKI FETTA GOAT 200GM	A
AAKRONA GOAT 200GM	N
SKI QUEEN GOATS WHEY 250GM	O
CATHEDRAL CHEVRE GOAT 100GM	O
HELLENIC GOAT CHEVRE ASH 200GM	A
HELLENIC GOAT COMBINATION 130GM	A
SKI QUEEN GOAT GJETOST	R/W O
CHEVRE GOATS CHEESE 100GM	A
SOUTHCAPE GOAT SUN TOM 150GM SW	A
SKI QUEEN GOAT GJETOST 250GM	O
SOUTHCAPE GOAT	R/W A
HELLENIC GOAT COMBINATION 100GM	A
SOUTHCAPE GOAT ASH 150GM SW	A
ELCO FETTA GOATS MILK	R/W O
ROSDALE GOAT MILK CHS	R/W O
MILWA GOAT 120GM	A
MILWA GOAT 800GM	A
DELI FETTA GOATS	R/W O
DELI GOATS CHESE WITH ASH	R/W A
DE BELLAY GOATS FRENCH 1KG	O
SOUTHCAPE GOAT	BULK O
BOURDIN GOAT HERB/GARLIC 115GM	A
FRICO GOATS CHEESE	R/W A
MOONDYNE GOAT 200GM	A
BOURDIN GOAT BASIL 115GM	A
BOURDIN GOAT PEPPER 115GM	A
HELLENIC GOAT FETTA VAC PK 250GM	A
BUTTERFIELDS MILANA GOATS	BULK A
LEMNOS FETTA GOATS	R/W A
ELCO GOAT	R/W O
SOUTHCAPE GOAT FETTA 120GM SW	A
YEA CHE GOATS PLAIN 100GM	A
CLOVER CREEK GOATS MILK 250GM SW	A
HILLWOOD FETTA GOATS MILK	R/W A
FRICO CHV (GOATS) 4KG	R/W O
GOLDEN GOAT FETTA 200GM	A
COGMO GOATS FRESH 125GM	A
COUTURIER GOAT CHS PLAIN 110GM	O
COUTURIER GOAT CHS HRB/GRLC 110GM	O
GREEN ISLE FETTA GOAT 300GM	A
GREEN ISLE FETTA GOAT	R/W A
CANTARELLA GOAT ROSE	R/W A
NORMANDIE GOAT FALDEL	R/W A
DELRE CAPRAKAS GOATS 100%	R/W O
COUTURIER GOAT CHS ASH 110GM	O
ROUSSAS FETTA GOAT	R/W O
WESTONPORT GOATS 2KG	A
CLOVER CREEK FETTA GOAT	R/W A
MAYER GOAT DUTCH	R/W O
YEA GOATS CHELLI 100GM	A
YEA GOATS PEPPER 100GM	A
YEA GOATS GARLIC 100GM	A
YEA GOATS PARSLEY 100GM	A
DELRE GOATS CAPRAKAS	R/W O

A - Australia
 N - New Zealand
 O - Other

R/W - random weight SW - singly wrapped

Rural Industries Research & Development Corporation – Project PTP-11A

Improving Productivity and Specialty Cheese Production in the Australian Dairy Goat Industry

GOAT CHEESE MARKET SURVEY

Dear Retailer,

Here is a short survey on behalf of dairy goat farmers and cheesemakers. It is a vital part of a research and development project aimed at maintaining supplies and quality of Australian goat cheeses. We would like to get a better idea of what you and your customers want, and how we can meet those needs.

You will be given feedback from the survey in a report which will aggregate all responses and mask individual replies. The report will be valuable for the industry by giving information on preferences and trends.

Please send in your returns, in the enclosed reply paid envelope, or by fax, by September 16, 2000, to enable quick analysis and reporting. Your data will be treated with strict confidentiality at all times. If you have any queries regarding this survey, contact Gaille Abud, Project Officer, on (03) 9718 2041 (phone/fax)

RESPONDENT DETAILS

Name _____ Telephone (____) _____

Address _____ P/Code _____

Please answer the following questions by ticking the appropriate box or by supplying the requested information

1. Whom do you see as your main customers for goat cheese? (eg. sex, age, background, business)

2. Do your customers prefer Imported Goat Cheeses compared to Australian? Yes No

If yes, why? _____

3. What is the usual quantity of goat cheese purchased by your average customer?

per call gms/kg per week gms/kg per year

What is the total quantity of goat cheese you would sell in a year?

4. Which of the following types of goat cheese do you stock in your store?

Fetta Fromage Frais Plain Chevre Other Chevre (ashed, herbs)

White rind Blue vein Other (please describe) _____

Which of these types do you sell the most of? _____

5. What is your main method of supply of goat cheese to customers?

Pre-packaged Cut to customers' requirements

Can you give reasons for this method? _____

6. Is packaging a problem? Yes No
If yes, what is the problem? _____
7. What is the main use for goat cheese purchased by your customers?
For table cheese For cooking Don't know
8. What are your customers' expectations regarding taste & texture?

9. Is there a price barrier? If so, at what point? _____
10. Is there any discounting? Yes No
If so, why? _____
11. Do you experience much wastage? Yes No
If so, why? _____
12. Have you any comments on brands, eg consistency, availability, popularity or other?

13. Is seasonality a problem? Yes No
If so, when? _____
14. What are the main factors limiting sales of goat cheese? _____

15. Who is/are your main supplier(s) of goat cheese? _____

16. Is the current trend in demand for goat cheese? Increasing Decreasing Steady
17. If you would like to have more information about goat cheese, which topics would be of interest?
Description of the cheeses Recipes and serving suggestions
Storage hints Shelf life Other (describe) _____
18. Please describe any problems or suggestions you have related to the retailing of goat cheese?

Thank you for completing the survey

**Appendix III: Report on Study Tour to International Goat Conference
– France, May, 2000**



REPORT ON STUDY TOUR
to
INTERNATIONAL GOAT CONFERENCE
FRANCE - MAY, 2000

a component of
Rural Industries Research and Development Corporation Project PTP-11A
*“Improving Productivity and Specialty Cheese Production in the Australian Dairy Goat Industry
– Phase 2”*

Report compiled by Project Investigators: Arthur Stubbs & Gaille Abud
with valuable contributions from:
David Brown & Jo Hall
Tony Barker & Bruce McGregor

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REPORT ON STUDY TOUR

to

INTERNATIONAL GOAT CONFERENCE – FRANCE, MAY,2000

1. Introduction

A component of the current Rural Industries Research & Development Corporation Project PTP-11A, “Improving Productivity and Specialty Cheese Production in the Australian Dairy Goat Industry - Phase 2”, was to have an industry study group visit a country with a well established and world recognised goat cheese industry. The country selected was France, and the tour was scheduled to coincide with the International Conference on Goats, held in Tours, close to the heart of the French dairy goat industry, from May 15-21,2000.

The prime objective of the tour was to compare project achievements, and Australian developments in farm management, herd improvement, cheese production and marketing techniques, with practices in a more mature production and marketing system.

2. Industry Study Group

The industry study group comprised four persons, which included the project researchers, Gaille Abud and Arthur Stubbs, Jo Hall from Gippsland as a producer representative, and David Brown, Milawa Cheese, representing the manufacturing and marketing sectors of the industry.

In addition, a number of other people connected with the Australian dairy goat industry attended the conference. Many were able to assist the study group with investigations and liaison with dairy goat people from other countries.

3. Conference Outline

The conference was the seventh of its kind, held every four years in a country where there is a significant goat industry. All facets of the industry were discussed, including goat husbandry and genetics, production of milk, meat, fibre or skins, product quality, manufacture and marketing, research and extension, and the social and environmental effects of goat farming.

About 800 people attended the conference, from many countries in both hemispheres. The spectrum ranged from those of tropical regions, where goat farming is still largely a cottage industry, to representatives of countries with long established and highly developed goat industries such as France. 30 people attended from Australia and 5 from New Zealand.

Fig. 1 *Chateau Chambord in the Touraine region*



4. Conference Program & Agenda

The structure of the conference program was:

May 15-18	Plenary or concurrent lecture sessions and round table discussions in Tours
May 19	Technical visits to farms and institutions in the Poitou-Charentes region
May 20	Symposia discussions connected to the technical visits, held in Poitiers
May 21	Cheese Fair at Saint Maure de Touraine

The program included a Goat Cheese Buffet and a Conference Dinner on separate evenings. (At the Cheese Buffet, a small selection of Australian goat cheeses was presented and quickly consumed to great acclaim.)

The study group concentrated on conference topics of particular interest and relevance for Australia including: Nutrition and Feeding Strategies; Parasite Control; Mastitis Control; Pathology; CAEV; Udder and Milking Capacity; Genetics and Selection; Reproduction; Quality of Milk and Dairy Products; Regional Goat Industries; Goat Milk Collection and Processing; and Technology of Goat Milk and Cheese.

5. Dairy Goat Industries Overview

A perspective of international dairy goat industries can be gained by comparing France's historic industry with those of the USA, Australia and New Zealand.

(Figures shown are best estimates, but sufficiently approximate to provide a comparison)

Country	Population	Dairy Goats	Milk Prod.	Prod./Doe	Cheese Prod.
France	60 m	900,000	430 m litres	480 litres	33,000 tonnes
<i>Poitou-Charentes</i>	?	260,000	174 m “	670 “	15,000 “
USA	260 m	~1 m	~500 m “	~500 “	~40,000 “
New Zealand	3 m	12,000	6 m “	500 “	~100 tonnes
Australia	20 m	5,000	2.5 m “	500 “	~200 “

The French dairy goat industry is a relatively significant primary industry per head of population, and has been producing staple food items, nearly exclusively cheese, that have been a part of French culture for generations. The major region is Poitou-Charentes (part of the conference venue) where the higher producing farms and the largest cheese factories are located.

Cheese is also the main product in the USA and Australia, whereas whole milk powder is the predominant product in New Zealand.

6. Goat Dairying in France

France has about 900,000 dairy goats in 8,000 herds, an average herd size of 112. Around 60% are in the west central regions of Poitou-Charentes and the Loire Valley, where the larger herds are also found, with the balance scattered through east central and southern France (see Fig. 2).

Saanens make up 52% of the total, just ahead of (French) Alpines at 43%. Prices paid for milk are about FF3.20 (A\$0.80) per litre. Although production levels vary considerably over France, average herd production in the core dairy goat regions is very impressive at nearly 700 litres per doe. Many farms in these areas have lactation averages exceeding 1,000 litres per doe.

Dairy goat farming is usually combined with some cereal cropping or other livestock such as cattle or sheep. Specialist goat farms are the exception. In the west central regions, farm income is typically 50-60% from goats and the balance from crops and other livestock. Cropping and loans for crop machinery are subsidised, in contrast to using land for pasture, so sophisticated grazing techniques for livestock, as used in Australia, have had no reason to develop. Goats are generally housed and fed in barns with grazing now a rarity, particularly in the more concentrated regions, due mainly to a shift to more intensive land use. Grazing is a little more common in southern regions. Typical rations fed include maize or

pasture silage, lucerne or pasture hay grown on the property, plus grains and concentrates, usually as pellets.

Fig. 2 *Distribution of Dairy Goats in France*



The bulk of milk production is for cheese manufacture, about 30% still made on farm but the trend is to factory manufacture. In the west central regions, more than 80% of cheese production is by factories with the three largest factories accounting for more than 75% of total production. Total goat cheese production in France in 1998/99 was 33,000 tonnes (compared with 607,000 tonnes of cow cheese), 47% of which was the Buche (fresh chevre) type. Retail prices of goats cheese range from FF50 (A\$12) per kg for Buche, to FF110 (A\$28) per kg for Crottin, a matured cheese.

Cheese production is regulated in France, similarly to wine, by “appellation controlee” (AOC) standards whereby milk production and cheese manufacture in each region must conform to certain specifications, often connected with traditional methods, before it can carry locality and type labels, eg, *Chabichou du Poitou*, *Ste Maure de Touraine*.

7. French Dairy Goat Industry Organisation

With such a long history, and to an extent due to European culture, it is not unexpected that there is a plethora of organisations representing, servicing and controlling the French dairy goat industry. Some of these are specifically dairy goat oriented, others are concerned with a range of livestock, but most appear to have a national focus.

At the summit is the French Ministry of Agriculture, which has regulatory control over such matters as production quotas and health issues, in conjunction with European Union standards, and administration of the AOC accreditation system.

National livestock organisations servicing dairy goats, many of which appear to have a statutory or semi-government status, include:

INRA – the National Institute of Agricultural Research, a government body involved in many areas of research relevant to the dairy goat industry, eg, genetics, breeding scheme, nutrition, health.

France Controle Laitier – the Milk Recording Organisation, controlling milk recording operations on farm.

CTIG – the Computer Centre of Genetics, the national livestock data bank which calculates breeding values and associated indexes.

CRI – Regional Computer Centres (4 in France) which receive, calculate and store data from Regional Laboratories, and send data to CTIG for national analysis.

Institut de l'Élevage – a livestock breeding organisation involved in monitoring milk recording and genetic improvement.

Sersia France – the national livestock semen export organisation.

ENILIA – the School of Milk and Food Technology which provides training and professional technical assistance to the industry.

BTPL – the Milk Promotion Technical Office, involved in training and extension of best milk production practices

Alliance Pastorale – an Association of sheep and goat breeders and cheesemakers, provides a range of technical, advisory and commercial services.

Organisations specifically servicing the dairy goat industry, a number of which are co-operatives, include:

ANICAP – the French Association of goat's milk producers and processors.

Caprigene France – runs the breeding program for genetic improvement of dairy goats (Alpine and Saanen breeds) in collaboration with Capri-IA. It is funded 50% by breeders and 25% each by the Ministry of Agriculture and Member and Regional organisations.

Capri-IA – the goat semen production centre, includes a network of regional insemination centre co-operatives.

ITPLC – the Technical Institute for Goat Milk Products.

CRDC – the Caprine Resource & Documentation Centre, created by the West-Centre interprofessional organisations, a common service between ENILIA and ITPLC.

CIRVAL – an international resource and networking centre with dairy goat material available.

This wealth of research, extension and technical services has placed the French dairy goat industry at the forefront in development of world knowledge, particularly in cheese production and marketing, genetic improvement and quality control.

8. Nutrition & Feeding Strategies

8.1 Grazing & Forage Harvesting Practices

Feeding by grazing pastures has become very much the exception in French dairy goat farming, rather than the norm it was several decades ago. As production systems have intensified, particularly in the more concentrated dairy goat farming regions, free grazing has largely been replaced by a “zero grazing” approach. This can include fresh pastures or other forages (maize) regularly cut and fed, with supplementation, to goats in sheds, or a feeding ration composed entirely of conserved fodder, grain and supplements. Some grazing is still practised in the less intensive regions of southern France, and can be required under some AOC conditions.

The change from grazing to intensive feeding appears to have been gradual and to have occurred for several reasons which are difficult to isolate according to relative importance, and probably vary between regions. Factors involved include worm control, increased herd sizes, more effective and profitable use of land by cropping, and ease of feeding. The prices now received for milk, and subsidised returns from crops, certainly influence the current practice.

Forage harvesting (green cut) and fodder conservation, as hay or silage, are widely practised using pastures (predominantly grass), lucerne or maize, in combination or separately. Forage harvesting by the “cut and carry” method is popular and may be conducted several times each day.

Field Observations

- One farm was feeding out pasture to goats, cut several times a day (for 7 months of the year). It was very long (40-80 cm. and mostly stalk) ryegrass of an annual cultivar, with some clover in it. Goats were eating it keenly. Leftovers were thrown out daily. This farm intends to graze goats in September – required by the body which controls cheese making licences in this district (Ste Maure AOC), apparently to give a more ‘natural’ image. They intend to make 4 x 1 hectare paddocks and rotate goats around them.
- All farms visited cut pasture hay to feed to goats, not high quality; some also cut their own lucerne. Only one was making a feature of feeding only what they grew on the farm (grain as well) but most bought in most of their feed, even though they were growing grain – which they sold rather than used.
- Two typical farms were: one of 99 hectares, which included 40 ha. of wheat, 25 ha. rape, 20 ha. sunflower, 8 ha. lucerne, 6 ha. pasture; and another of 72 hectares, which included 28 ha. of pasture, 24 ha. maize, 20 ha. cereals.
- On one farm it was reported that cheesemaking properties of the milk were better with some grazing. On another, higher milk production was claimed from grazing pasture.
- Goat interest in pasture noted to be higher in afternoon, possibly due to the effect of sunlight on palatability and nutritive content.

Relevant Conference Papers

- Italian study showed that milk and cheese produced from goats grazing pastures had higher levels of a-tocopherol, the main form of Vitamin E, which reduced fat and cholesterol levels, than goats in a zero grazing, high concentrate supplementation system (p 580)

8.2 Feeding Practices & Policies

Feeding regimes on French dairy goat farms are almost without exception based heavily on supply of forage, grains and concentrates to goats in barns, and almost exclusively so in the intensive, central west regions. Although some feeding is ad-lib, there is attention paid to the energy and protein content of feeding rations. Commercial pelleted mixes, inclusive of vitamins, are available for young goats. Mineral supplementation or concerns about minerals appeared not to be widespread, however in at least some cases minerals were included in pelleted rations. Salt licks are sometimes used but not as a general mineral supplement.

The usual ration is based on pasture and lucerne hays and/or silage, often maize silage, with concentrates such as lucerne pellets, other pellets such as sugar beet pulp, maize, barley, or other grains supplied as a mix. Feeding is not usually done in the milking bail, but more commonly in troughs or on concrete flooring outside pens, with access through bails. Hay or grass is forked out on ground, onto conveyors or into troughs and pushed into reach as needed. Goats appeared to have access to this to appetite. Some automatic overhead systems were in use for grain or pellets.

Fig. 3 *French Alpines & Saanens*



Field Observations

- Farms visited fed ad-lib hay, often pasture hay (or part lucerne hay) of low quality (est.8.5% ME), plus a concentrate mixture fed once or twice a day. Often a commercial pellet with minerals was included. Usually 0.8 -1 kg a day and included maize, barley, lucerne pellets, soy meal. Total of 2.8-3 kg DM.
- One farm had a ‘total milk ration’ put out once a day, but half pushed back out of reach of does until evening.
- All farms fed all does the same concentrate ration, despite different stages of lactation, but one had a feeding station which recognised higher yielding does with electronic devices in their collars and fed them extra.
- Some farms fed a contentment ration while milking and the rest of the food in the shed.
- Typical lactation rations/doe/day (as DM) on two farms were:
Farm 1 – 1.7 kg hay + 1 kg dried lucerne + 0.5 kg maize + 0.3 kg protein rich concentrate + 0.25 kg barley + ad lib straw = 3.75 kg DM total.
- Farm 2 – 1.3 kg maize silage + 1 kg dried lucerne + 0.35 kg protein rich concentrate + 0.25 kg cereals + 0.15 kg hay = 2.8 kg DM total.
- On-farm cheesemakers in particular sometimes will not use silage, perhaps due to concern about taint, or disease (listeria).

Relevant Conference Papers

- French study of 595 farms in the central west region looked at the effect of the nature and quantity of forage and concentrates fed for year on milk yield and composition. Nine different systems were evaluated, the major difference being the nature of main forage fed. Milk yield and composition were not significantly different, there was more variability within than between systems. For all systems energy was the limiting factor in quantity of milk and protein, while fat depended on fibre level.(p157)
- The large dairy herds of western France are characterised by high production levels, the use of zero grazing systems with maize silage, hay and dehydrated alfalfa complemented with high level of concentrates (350-420 kg/year/goat according to main roughage in the diet). (p 286)
- Young goats in Australia grew faster, and at lower cost, on a ration of human food by-products (bread, biscuits and peanut shells) than two commercially available goat feeds (p 137)
- Indian research showed that goats fed sodium bicarbonate and magnesium oxide as buffers to decrease rumen acidity, with a diet of concentrates and legume straw, had lower levels of short chain fatty acids, which are related to the goaty smell in milk, and higher levels of unsaturated fatty acids, which are beneficial to human diets, thereby improving the quality of milk fat. (p 161)
- French work with decoquinate, a coccidiosis inhibitor, indicate that it can improve growth of young does if added to rations for 30 days post weaning, and first lactation milk production if fed for 75 days post weaning, even if clinical signs of coccidiosis have been absent for some years. (p 180)

8.3 Bodyweights & Condition Scoring

French farmers appeared very familiar with the practice of assessing bodyweights by thoracic circumference measurement using tapes, and with the parameters for converting measurements to weights. However, condition scoring appears to be unknown as a management tool for dairy animals.

Generally accepted target weights, growth rates and ages are: birth weight 3-4 kg; wean (off substitute milk) at 16kg (8 weeks); join at 30-34kg (7 months) to kid at 50-55kg (12-15 months); expect growth to continue post first kidding to 60kg average adult size, range 50-80kg with Saanens 15+kg heavier than Alpines. Saanen bucks 90-100kg, Alpine 80kg.

Field Observations

- Does observed at Melle school, recently kidded, scored about 3.

8.4 Kid Rearing

Precise regimes were not obtained, but generally appeared to follow convention. Practices described included colostrum for 2-3 days, followed by reconstituted cows milk (fairly common in Poitou region) via lamb-bar or free access, some fed 2 litres/day. Off milk at 16kg/8 weeks. Hay/straw and grain/pellets available from a few days old.

8.5 Buck Kid Sales

Goat meat markets exist for young (3 weeks) and older (2-4 months) dairy buck kids. Most of the young kids are exported to Italy. Kid finishing farms pay producers up to FF80 (A\$20) in autumn and FF30 in spring for surplus kids, a few days old. Young kids weigh 10 kg when sent for slaughter and fetch about FF15 /kg live weight in autumn, peaking at FF30 /kg live weight at Christmas and Easter. Skins sell for FF5 per unit but the market is variable.

Older kids are slaughtered for restaurants, butchers and speciality meat products. Carcasses are 10-12 kg (including head) and bring FF50-60 /kg. These are advertised and often directly sold in Farmers Markets in local larger cities.

Kids are housed in barns, on deep litter, in groups of 50 per pen. Automatic milk feeding machines are used to supply ad libitum rearing formula. Mortality is about 12% with a high incidence of lung disease (*Pasteurella pneumonia*). Kids are not vaccinated and coccidia is prevented by feeding kids via milk feeders.

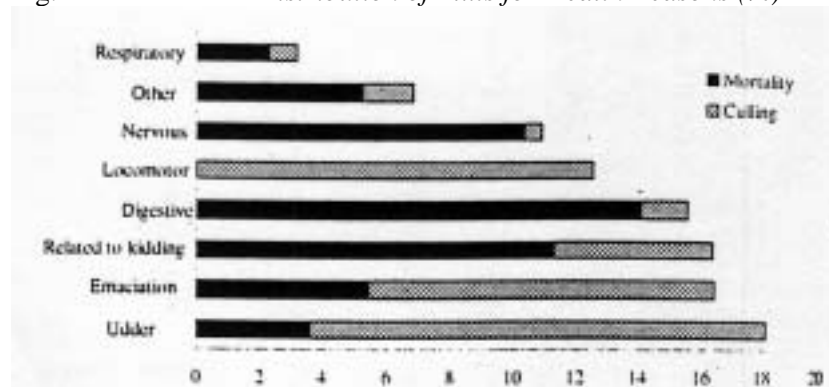
9. Animal Health

9.1 Incidence & Management of Health Problems

Animal health problems found in French dairy goats are similar to those in other temperate locations, including the universal concerns with nematode parasites and mastitis, as dealt with in later sections. Other diseases of economic importance, and where preventive measures are usually taken, include: CAEV (caprine arthritis-encephalitis virus); Paratuberculosis (Johnes Disease), Chlamydia (abortive disease with implications for pregnant women); Q Fever; and Listeriosis. Feeding related diseases such as acidosis, enterotoxaemia and pregnancy toxaemia are the predominant health disorders in intensive goat farming systems.

Surveys of large dairy goat herds in western France during the '90's have shown that death and culling rates related to health disorders averaged 10.7%, but was highly variable (25% of herd years had rates below 7%). A large proportion of these exit rates were connected to feeding or metabolic disorders. Mastitis and lameness were other important exit reasons. The distribution of exits for health reasons is shown below (Fig. 4).

Fig. 4 *Distribution of Exits for Health Reasons (%)*



‘Locomotor’ disorders may be frequently related to CAEV, whilst ‘Emaciation’ and ‘Nervous’ disorders have been associated with Paratuberculosis and Listeriosis respectively. The study also revealed that exit rates for low production averaged 9%, and for infertility 4%. Total exit rates (culling and mortality) averaged about 27%, and replacement rates averaged 34%.

Field Observations

- Diseases appeared sometimes not to be noticed. One farm had signs of abscesses (Cheesy gland?) and swollen joints (CAEV?) but the farmer stated he had no herd health problems.
- Melle College farm had just obtained CAEV free goats from various sources (first kidders) as the old herd was badly affected. New shed, no contact with old herd. Kids taken at birth or soon after.
- At Melle, goats were vaccinated for Johnes Disease, Chlamydia, Q fever, and another disease which appeared to be related to the face/neck and pregnancy.
- One farm described considerable loss of production over the last 3 years due to mycoplasma pneumonia with 20 of the 150 goats still affected.
- Another farm vaccinated against Q fever, Chlamydia and ‘Abortion’. Coccidiosis in kids has to be monitored.

Relevant Conference Papers

- ‘Mortality and health related culling in large dairy goat herds of western France’ (referred to above) (p 285)
- Polish study showed the connection between seroprevalence of CAEV in a herd, a 24% reduction in milk yield and a two-fold increase in somatic cell counts over six years (p 815)
- Mexican study in one herd showed that goats seronegative to CAEV produced 11% more milk than seropositive goats. (p818)
- Development of new diagnostic tools for more effective identification and treatment of the various CAEV strains in France. (p 820)
- Swiss account of an eradication program in very small herds, based on serological testing, removal of kids at birth from infected mothers, and rearing them in separate herds with cows colostrum and milk, which eliminated CAEV in two regions within five years. (p 821)
- French study on Listeria contamination in milk showed that strains found in the environment and in the milk did not match. Analyses of faecal matter and herd milk are the best indicators. There was no evidence of Listeria on farms with uncontaminated milk. (p 587)

9.2 Nematode Parasites

Although intestinal worms did not currently appear to be a great concern under the intensive goat farming, and often zero grazing, systems in the central west region of France, their potentially adverse effect on health and productivity is well recognised and remembered. On the broader European scale, the universal problems of sustainable infestation control, anthelmintic drench suitability and resistance are receiving constant attention.

Goats are said to have special characteristics, compared to other ruminants, with regard to their susceptibility to higher worm infestation, which can be aggravated by close grazing; and effectiveness of conventional anthelmintic drugs, which, possibly due to goats' faster metabolism, should be given at higher dose rates than for similar ruminants (sheep). The consequence of under-drenching is rapid development of drug resistant worm populations in many situations.

On the other hand, it has been demonstrated that there is a positive relationship between better nutrition and better performance, despite worm burdens, due to better nutrition providing more resilience to infestations through tissue repair and an immunological response.

Current worm control strategies were defined. They included 'external' strategies, based on limiting host/parasite contact, such as grazing management, forage management and nematophagous (predatory) fungi; and 'internal' strategies, aimed at reducing worm burdens, such as drugs, vaccination, genetic selection or dietary manipulation. Most of these strategies are at an early stage of development, but all control measures should be considered as complementary to the use of drugs rather than as alternatives. In addition, strategies will need to be applied at a local, rather than a global, level to take specific situations and circumstances into account.

Of the external strategies, grazing management, with or without rotations, tends not to work in temperate climates where parasites have prolonged survival on pasture. Zero grazing, or perhaps low intensity grazing, are more effective. Mixed grazing enterprises, using cattle as well as goats, and lots of forage conservation may help but there are few practical examples of mixed grazing with goats. Also, alternative grazing with other ruminants leads to selection of co-adapted parasite populations. A new idea, not yet available commercially, is a predatory fungus (*Arthrobotrys*), which if fed to goats is spread in their faeces on pasture as spores. The fungus then eats worm larvae. It does not persist long and must be fed to goats regularly.

Internal strategies, apart from the necessary use of drugs, include special feeding regimes. Forages containing high levels of condensed tannins have been shown to reduce worm infections in small ruminants, but depress production. Administration of copper oxide to goats can reduce populations of *Haemonchus* (Barbers' Pole) but not other species. Work on a vaccine to produce immunity is also proceeding, however development of immunity to parasites in goats appears to be relatively slow, compared to sheep, and develops later. Genetic selection may eventually help to reduce anthelmintic use. Resistance is 'moderately heritable'. In Scottish Cashmeres it was found to be possible to reduce FEC's by about one third after 5 generations of sire selection.

Field Observations

- On two farms comments made were "very little parasite concerns – no need for worm control", and
- "goats not checked for parasites".

Relevant Conference Papers

- 'Options for the sustainable control of gastrointestinal nematode infections in goat production systems in Europe'. (referred to above) (p 789)
- Most cases of anthelmintic resistance in goats in France are connected with the benzimidazoles, and *Haemonchus* is the species most prone to resistance. Related factors include insufficient dose rates and exclusive use of benzimidazoles for many years due to low residues in milk. Ivermectins, the latest drugs released, show low levels of resistance to date. (p 793)
- Protein supplementation (with soybean meal) in Mexico has resulted in increased resilience of kids to *Haemonchus* infestation. (p 795)
- High producing and first lactation goats were found to be responsible for most of the worm egg excretion in herds in southern France, suggesting that anthelmintic treatment could be more effective and economical if done selectively within a herd. (p 796)

9.3 Mastitis & Somatic Cell Counts

The association between clinical or subclinical mastitis and udder infections with pathogens, notably *Staphylococcus aureus*, is well documented, and a common health problem in goat herds around the world. Such infections quickly lead to losses in milk production and milk quality due to bacterial contamination. A follow on effect from lower quality is a reduction in cheese yields.

Udder disorders were the most important health reason for culling in large herds in France in the study discussed previously (see earlier graph). Culling for this reason has increased recently, probably due to the introduction of payment penalties for milk with high somatic cell counts (SCC).

Monitoring the presence of subclinical mastitis through SCC has been the conventional means, and accurate parameters have been established for dairy cows. However, there is some discussion whether these parameters translate well to dairy goats, due mainly to a higher release of cell particles during milk secretion in goats for several reasons unrelated to udder infection. Milk from goats free of udder infection may have a SCC of up to 1,000,000 whereas the limit for cows is less than 100,000. Clinical cases of mastitis are substantially higher in cows than in goats

French data suggests that if SCC is over 1,000,000 there is a 17% reduction in cheese yields, and also a heavy increase in proteic rates, ie, a slight decrease in milk proteins and increase in soluble protein. A clear relationship is claimed between SCC, milk production and milk quality. Present quality assurance requirements in France are for a SCC of less than 1,000,000, although a target of 300-400,000 is being considered. In the USA the limit for goat milk is 1,000,000, whereas the cow milk standard is 750,000.

Monitoring of SCC is recommended by use of electronic equipment (eg, Fossomatic) that counts nucleated cells rather than particles. Monitoring goats milk by use of a Bactroscan is apparently not working in Norway. Calibration of testing equipment in France is by cows milk. Results are satisfactory as it is the deviation that matters. Cow mastitis control treatments are used on goats, a full dose in each udder half.

Immunoglobulin screening of milk is used widely to check for *Staphylococcus* gram negative organisms.

Relevant Conference Papers

- 'Significance of pathogens in goat mastitis' – discusses the importance and effects of *Staphylococci*, *Mycoplasma*, *Streptococci*, Gram negative and positive bacilli, viruses such as CAEV, and other bacterial pathogens. (p 753)
- American account of SCC limits, as dictated by cow milk standards, and comparisons between cows and goats regarding SCC levels, udder infection rates and incidence of mastitis. (p 755)
- French interpretation of SCC levels. (p 757)
- Recommended quality payment system for goat milk in France including criteria such as total colony count, SCC, IgGI, antibiotics and lipolysis. (p 761)
- French study indicating that if SCC mean is less than 500,000, majority of goats are considered healthy, and if mean exceeds 2 million, more than half the herd are probably infected. (p 764)
- French comparison of direct microscopic and automatic (Fossomatic) methods of measuring SCC which found reasonable accuracy by Fossomatic. (p 765)
- Spanish study showing that zinc methionone supplementation seemed to play a positive role in resistance to mastitis through synthesis of keratin, a natural barrier in the teat canal. (p 767)

Conference Comments

- Mexico: less than 15% infection rate and less than 500,000 SCC. Aspirin and Telotoxin used to reinforce immune system.

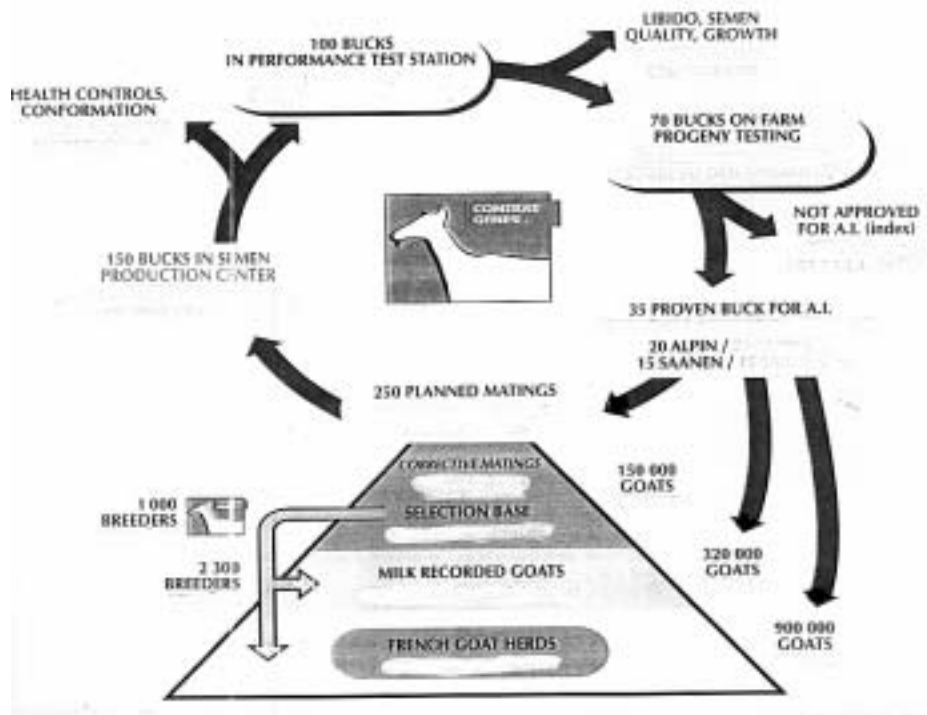
- Norway: Had a problem so 5% culled annually rather than treated, now incidence is 1-2%. Milking equipment & genetic influence noted.
- France: cell reinforcement feeds decreased SCC in cows by 30-40%.

10. Breeding & Genetics

10.1 Genetic Improvement

France has a very impressive national genetic improvement program which started in the '60's, based on milk recording, AI, and progeny testing to improve cheese production. Currently the program revolves around 1,000 elite, nucleus herds, totalling 150,000 goats, in which planned matings are made, by AI, between proven bucks and the best does (Alpine and Saanen breeds). From about 250 planned matings each year, 150 young bucks are born, of which about 70 pass physical soundness and semen fertility tests, and are then progeny tested (each with about 40 daughters) in the nucleus herds. About half of the 70 (20 Alpine, 15 Saanen) are classified 'proven' and used for the next round of planned matings. The cycle takes about 4 years. Proven buck semen is also used by other French goat herds and some proven bucks are distributed for on farm use. The program reaches about 39% of all dairy goats in France. (Fig. 5)

Fig. 5 Selection Program for Genetic Improvement of Dairy Goats



Selection was originally based purely on protein yield and content of milk, which is positively related to cheese yield. This has recently been adjusted slightly for fat yield and content to allow good cheese quality and flavour, with all factors weighted by their economic values based on milk prices paid and cheese yields. Selection and planned matings now also take into account the type of casein alleles genetically carried by bucks and does, which further influence cheese yields and flavour.

Type appraisal is used to qualify bucks and does for planned matings and during progeny testing, with emphasis placed on economic traits such as udders, feet and legs and body capacity (thoracic capacity/measurement). All genetic evaluations are made using the 'animal model', based on the latest biometrical techniques.

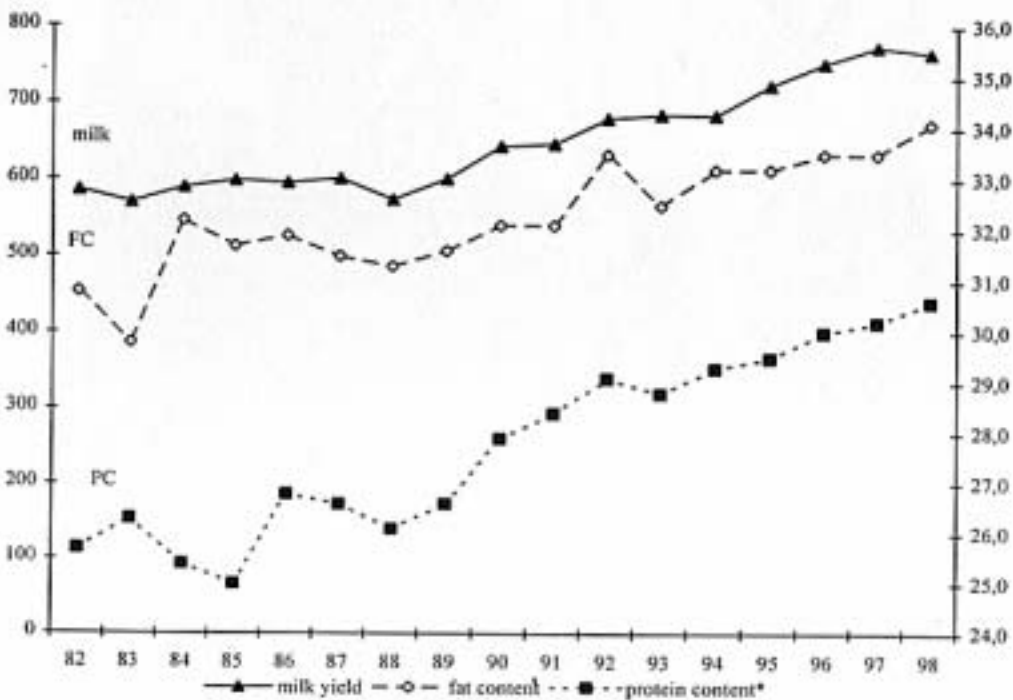
Milk recording, the foundation of any genetic improvement system, started in 1966. In 1998, 288,000 goats (52% Alpine, 43% Saanen) were milk recorded in 2400 herds, equalling 32% of all dairy goats in France. Average milk recorded yields are 766 kg milk, 23 kg protein (3.1%), and 26 kg fat (3.4%), for 274 day lactations. The main method is monthly (am + pm), whilst 20% of herds use alternate monthly am/pm

Milk yields are weighed on farm by technicians, employed by 50 'departmental committees', federated by France Controle Laitier, and samples are sent to Regional Laboratories for uniform analysis of protein, fat and SCC. Yield and test data are sent to 4 Regional Computer Centres (CRI's) which also collect data on identification, pedigree, matings, kiddings and other 'management data'. CRI's send data files to the national data bank at the Computer Centre of Genetics (CTIG) where 'official and additional validations' are performed.

Automatic recording, electronic identification, data supply on disk or email to farmers is just being developed. No comprehensive PC packages for on farm herd management appear to be available, only modules connected to feeding (Ratiochev) or breeding (Episode).

Production improvement over the last two decades in the French dairy goat industry is illustrated by the following graph (Fig. 6) [Milk yield (left) is in litres; fat and protein content (right) is in grams/kilogram]

Fig. 6 *Evolution of Goat Performances recorded in France*



Relevant Conference Papers

- History of the French program for genetic improvement since the '60's, describing the partnerships between research and technical organisations in, firstly, the identification of protein yield as the major selection objective for cheese making, then development of on-farm milk recording, use of AI for planned matings and progeny testing, inclusion of fat content in the selection index, focussing on casein alleles, and finally the introduction of molecular biology as a selection tool. (p 18)

- French summary of current knowledge on heritabilities of milk production and caseins, udders and milking ability, technological and sensorial properties of dairy products, seasonality and some diseases; together with an overview of selection programs and results to date. (p 191)
- Short resume on milk recording of dairy goats in France (summarised above). (p 1045)
- Short resume on genetic evaluation of dairy goats in USA and Canada. Both countries have developed similar systems and selection indices to the French example since the '80's, without the same cohesive national partnership approach, and with an apparently greater emphasis on type traits. (p 1046)
- Short resume of genetic evaluation procedures for dairy goats in France. (p 1046).

10.2 Artificial Insemination (AI)

More than 150,000 matings are performed by AI each year in France, using semen from proven Alpine or Saanen bucks. Frozen semen is mostly used and insemination is by use of a speculum and standard insemination 'gun'. AI is generally used following hormonal treatment to induce oestrus and ovulation, or less commonly following natural onset of oestrus, observation of the latter generally being aided by use of bucks with a marking apron raddle. Inseminations are performed 12-24 hours after the first signs of oestrus. Fertility (in kid) rates of 65% are claimed using these techniques.

Field Observations

- One farm reported 60% of does in kid after 1st cycle, 80% after 2nd cycle, and 90% after 3rd. Maiden does are mated with bucks because conception rates with AI not as good.
- Another farm used frozen semen on 100 goats to early August, then fresh semen on another 100 in late August. This farmer was a DIY inseminator and claimed 85% conception rate from 1st inseminations. 1.6 kids born per doe on average.

10.3 Oestrus Manipulation

Induction and synchronisation of oestrus are fairly commonly used breeding technologies in France, particularly for the non-breeding season, and synchronisation appears to be the norm prior to use of AI. The accepted practices followed are those of photo-periodic treatment, use of melatonin, and hormonal injections or implants.

150-200,000 progestagen (sponge) treatments are sold each year in France and up to 70,000 goats are AI'd at induced oestrus in the non-breeding season, with an average fertility 65%. During the breeding season, progestagen treatment is sufficient to synchronise oestrus in over 70% of does. During the non-breeding season progestagen treatments work only if equine Chorionic Gonadotrophin (eCG, formerly PMSG) injection is used as well. Recommendation appears to be: injection 9 days after sponge insertion; then sponge out 48 hours later; AI within 40-45 hours of sponge withdrawal. If does come in heat after this, natural mating is used.

Field Observations

- Various methods, including photo-periodic treatment, hormonal injections/implants, etc, are used and farmers appear happy with whatever they were doing. Autumn kiddings appeared to be widespread although some of the information appeared contradictory. Difficult to assess what was the acceptable rate in actual figures. Perhaps 12-13% of total herd kid in spring.
- At Melle farm, 60% of AI followed use of sponges, but no lights.
- Another farm used lights and no sponges for year round kidding but actual practices and success rates were harder to elucidate.

Relevant Conference Papers

- Mexican research has shown that photo-periodic treatment of bucks for 2 ½ months in winter followed by melatonin (2 x 18 mg inserts) caused much increased libido when they were put with does 2 months later (when compared with untreated controls). In the control group no does came in heat in 1st 35 days, whereas nearly all does with treated bucks did. 38 out of 40 does were diagnosed pregnant at 35 days and 60% kidded, compared to none in the control group. (p 396)
- Brazilian work with Saanen does subjected to two months of long days (16 hours light) photo-period in late autumn/early winter resulted in successful spring matings, followed by a 76% kidding rate the next autumn. (p 406)
- Artificial long days (16 hours light) induced similar sexual behaviour in bucks in Mexico to that from artificial long days plus treatment with melatonin. (p 446)
- Progestagen/prostaglandin treatments, associated with 'eCG', can give a 60% birth rate in France, but excessive treatment of individual goats may produce anti-eCG antibodies, leading to decreased efficiency of the technique. (p 400)

11. Dairy Products & Marketing

11.1 Milk Collection Procedures

Milk collection from French farms occurs daily or up to every 3 days depending on production density, volumes and time of year. Factories operate large milk tankers, similar to those used for cow milk. Self delivery of milk was not mentioned, and is most unlikely in the more concentrated regions. Milk is also taken in from other countries, eg, Spain and the Netherlands, by some large factories (Soignon). Excess supply in spring is covered by transferring frozen curd and milk between other factories.

Bulk milk samples are taken on each farm at each pick-up and tested for temperature, pH, protein %, contamination with cows' milk. In addition, tests may be conducted on fat%, SCC, bacterial contamination, immunoglobulin, antibiotics and lipolysis, which are relevant to quality requirements and payment penalties. A winter production incentive is paid.

11.2 Milk Processing/Cheese Manufacture

Cheese factories (Laiteries-Fromageries) in France vary in size up to the largest in Poitou-Charente with a throughput of 100 million litres per annum. One factory visited processed about 15,000 litres per day, making it significantly larger than any Australian goat milk processor, but much smaller than mainstream dairy processors in Australia. However, the manual manufacturing techniques employed are similar to those used in smaller Australian plants.

On receipt, milk is pre-ripened to increase acidity by 1 degree, then geotrichum, CaCl and yeast are added. The milk is pasteurised and set for 18 hours at 23 degrees C in 150 litre tubs and part drained on cloth lined plastic baskets. The soft curd is then drained further in a variety of plastic hoops to make St Maure, Cabechou, Crottin, and Fromage frais. The cheeses are dry salted and drained for one day before maturing for five to ten days at 11 degrees C. Probiotics are used, along with usual starters, or alone as a starter for cheese to cater for 'health market'.

The factory operates with a HACCP plan but the condition of the working areas of the factory would not pass Victorian audit and the manual handling of curd would attract some criticism here.

Apart from the factories, there are several hundred on farm goat cheese manufacturers in France, the great majority of which are very small operations, using only the milk produced on the farm. A survey of these farms found that the workload was considerable, particularly on smaller farms. On average, 4,700 hours was needed to run such a farm, of which 45% was spent in breeding and management, 35% in cheesemaking, and 20% in marketing. Cheesemaking took an average of 4 ½ hours per 100 litres.

On farm cheese, or 'Fromage fermier', is generally made with unpasteurised milk and using combinations of whey starters and commercial cultures, the milk typically being set at 21 degrees for 24 hours before being drained in hoops for 2 days and matured for 10-25 days. The most significant difference between the cheese made on farm and in the factory is the delicacy with which the curd is handled. Because the volumes handled are so much smaller, the on farm cheesemaker can ladle the curd directly into the hoops without predraining, producing a finer texture in the curd developing into a fine waxy texture in the matured cheese. In the case of St Maure de Touraine, a straw printed with the AOC logo and registration number is inserted through the cheese to facilitate turning and identification.

Factories visited used equipment from a specialised manufacturer. The company makes a wide range of cheesemaking equipment from hoops and block moulds to automated salting machines and fully automated cheesemaking systems. Most equipment is built to order so there is little financial disadvantage in getting equipment customised. EEC subsidies are available for cheese factory plant and equipment in some European countries and it is suspected that this also applies in France.

11.3 Quality Standards

Apart from minimum food purity criteria, there is currently no uniform, official quality standard or payment system for goat's milk in France. Individual dairy companies establish their own standards and payment grades according to their requirements. ANICAP has recently made a national recommendation, which is expected to be recognised, and includes payment bonuses/penalties based on bacterial counts, SCC, immunoglobulin levels, antibiotic residues, lipolysis rating, and content of protein and fat. The current standard for drugs is 'no detectable residues'.

Lipolysis rating measures fatty acid breakdown, which has important implications for cheese flavour and the physical condition of milk relative to the cheese making process. Age of milk is a critical factor in flavour. Casein alleles, the latest emphasis in genetic selection, also have an impact on flavour and are correlated to lipolysis.

The European Union has adopted HACCP standards, however they are not working very well in France due to farmer and technician perceptions of their roles. There are not regular micro checks, just surveillance based on sensory tests and observation.

Goat cheese can have an AOC guarantee of origin if made from selected milk from a limited geographical area, and produced according to traditional methods (eg, drained, moulded with a ladle, salted by hand, then turned over). For example the Soignon range includes: *Chabichou du Poitou*, *Poulligny St Pierre*, *Ste Maure de Touraine*.



11.4 Effect of Feeding Practices on Product Quality

Feeding methods associated with poor hygiene will have obvious, deleterious effects on product quality through microbial and chemical contamination. Some conventional feeding practices are also recognised as affecting product quality and include the use of silage of low acidity, involving risk of contamination with *Listeria*, and nitrogen oversupply which can cause mammary inflammation, high SCC, and an adverse effect on cheese yields. The presence of antibiotics in feed can also have negative effects on cheese making by disturbing milk acidification and curding.

However, by themselves, a diverse range of feeding regimes, of varying quantities and qualities, have little apparent effect on end product quality. Two main dietary factors, the supply and nature of fibre and lipids, strongly modify the milk fat percentage and the fatty acid composition of goat milk and cheese. Protein percentage is less influenced by feeding. Fat percentage is a major factor for both creaminess and taste in cheese and has received recent attention in selection indices due to a gradual fall in fat content attributed to selection emphasis on protein.

Relevant Conference Papers

- ‘Effects of feeding on the quality of goat milk and cheese’ (summarised above). (p 53)
- One study compared goats on cultivated pasture (rye and fescue) plus 700 gm concentrate, with goats in house with lucerne hay plus 700 gm concentrates. No difference in yield (800-900 kg/year) or cheese characteristics (sensorial). (p 53)
- Use of concentrates has little effect on milk composition when goats are on pasture or rangeland provided concentrate is less than 50% of total DM intake. (p 53)
- Type of roughage affects fat %, eg, lucerne hay gives higher fat % than ground lucerne. (p 53)
- Italian study which found that high levels of concentrate feeding mask the aromas and flavours of milk and cheese compared with goats grazing pasture. (p 152)
- French review of the sensorial properties of goat dairy products refers to the association between ‘goat’ aroma, certain fatty acids, and the effect of lipolysis on the release of these compounds. (p 559)

11.5 Markets & Marketing Channels

Cheese products from large and small factories are mainly sold through distributors in France to retail and food service outlets. A small proportion is sold on site, at village markets, or exported to other countries. There is large and consistent consumer demand in France for products deemed 'specialist' in Australia. In the Touraine region locals and tourists eat goat cheese predominately including the small hand made products from the myriad local farm producers. The market for regional goats cheese in the Tours region of France is profoundly different to that experienced in Australia both at the retail and restaurant level.

Restaurants

In the Touraine region and in Tours itself there are hundreds of restaurants, cafes and bars catering to locals and tourists at every possible price range. Most are modestly priced and eating out rather than cooking at home appears more common than in Australia. Most establishments are fiercely parochial promoting Touraine wine and regional food specialties including cheese.

Every restaurant offers cheese and frequently as a set course in a fixed price menu. In almost every case the choice is exclusively Touraine goats cheese. The locals eat cheese because it is part of their culture and the tourists eat cheese because it is a part of the regional experience.

Retail

The retailing of cheese in Tours operated at three different levels. At the central indoor market, Les Halles, several large stalls concentrated on cheese sales. They carried cheeses from all over France but predominately Touraine products. There was a price premium attached to Fromage Fermier products and also to unpasteurised milk cheese. It is hard to know whether it is the hand made image of quality or the raw milk which is important. (At the famous cheese shop "Androuet" in Paris many cheeses were advertised as Fromage Fermier but none claimed raw milk as their point of difference.)

In Tours' main boulevard running past the station and the Town Hall, an outdoor market is held several times a week.. Dozens of stalls present local farm produce and several local cheesemakers sell their wares. A wide range of goat cheese was on offer: St Maure de Touraine, St Pierre, Cabichou and Crottin amongst them. Under proposed EC regulations refrigeration and better food handling practices will become mandatory, some of the stallholders had anticipated these requirements. Local and other cheeses were available in the supermarkets and delicatessens much as they are in Australia.

Typically, on farm cheese manufacturers sell between 10% and 20 % of their production at 'farm gate', some at markets, and the rest to distributors. Some larger operators have invested in small 'factories' to satisfy the increasing regulatory pressure being applied by the EEC and as a result are able to export product.

11.6 The St Maure Show

As part of an annual event, roughly approximating a country Australian Agricultural Show, is the annual St Maure National Cheese Show. The main celebration takes place around the town square and while the enthusiasm, noise and good cheer was similar to an Aussie show, the exhibits and the activities were less predictable. Stalls sold freshly shucked oysters, local sausages, breads and cheeses, Touraine wines were everywhere, and one stall offered tastings of real Champagne. The grand parade consisted of wave on wave of regional bands, all dressed in traditional costume, and led proudly by the Guild of Cheesemakers.

Cheese judging took place in the town gymnasium, and a very serious affair it was too. While there were many categories, by far the most exhibits were in the St Maure de Touraine class. The judges (which included Aussies, David Brown, Raye Carter and Jan Aland) were divided into small groups and spent

about 90 minutes assessing the minute differences between 8 different goat cheese entries. All would have done well at an Australian Specialty Cheese Show but the attention to detail and nuance would not have been present, this is borne of generations of experience, something which we will in time achieve.

12. Lessons for Australia

12.1 General Observations

Economic and social structures of countries have many differences that are quite profound. France is a large and wealthy nation that has the will and can afford, it appears, to offer support to rural sectors that Australia can only dream about. However, government support implies a level of bureaucratic interference that we might find difficult to cope with. Tradition is valued highly in France but is often difficult for the bureaucracy to deal with. For example, there have been complaints about how 'appellation controllee' has been applied to cut across local practice, but the system is valued.

Regionality in France means that local produce is traditional fare, and may not be readily available outside its region. Large urban areas are more cosmopolitan. In Australia, regionality means identifying where a product comes from, and does not imply any regional tradition. In fact it may be difficult to buy an Australian regional product in its own region and locals may rarely use it. Australian consumers appear more experimental.

12.2 Farming Methods

Dairy goat farming and feeding practices in France bear little relationship to Australian methods. The norm of zero grazing and intensive housing evident in France is the exception in Australia where some reliance on grazing pastures and forages is relatively high. Economic circumstances in France, notably cropping subsidies, appear to facilitate their 'high input' system, however climatic conditions and problems with worm control may have contributed to the present situation.

Nevertheless, provided effective worm control practices and adequate nutrition are maintained, it is considered that a prudent approach in Australia will be to continue to focus on low cost, pasture grazing based farming, of a reasonable scale, to produce a sufficient, reliable supply of high quality milk, at a reasonable price, to support a viable processing sector. This will enable the industry to be internationally competitive and capitalise on export market opportunities for cheese, and new markets such as powder and other products, whilst sustaining and growing the domestic market. Significantly, the French also recognise that grazing produces a better flavour in cheese.

Attention to feeding rations, and the paramount importance of an adequate energy and protein supply for young and milking goats, is no different between France and Australia. In contrast to Australian needs, French farmers have to rely on concentrate, and in some cases mineral, supplementation because of their intensive feeding methods. Some work with feed additives, used as buffers or as infection inhibitors, may have future relevance to our conditions. In addition, information about the influence of fibre types and lipid additives on fat levels and composition will be useful as cheesemaking becomes more sophisticated

Kid rearing techniques in France are conventional, and target weights and ages for weaning, joining and mature goats are similar to those followed in Australia. Condition scoring does not appear to be a management tool in France.

12.3 Animal Health

Dairy goat herds in France have most of the health problems experienced in other temperate countries, but in comparison with Australia, probably have higher metabolic disorders and lower parasite burdens due to the prevalence of intensive feeding. Reasons for deaths and culling, as compiled in a French survey, need to be compared with Australian experience to identify differences more precisely. Work being conducted on CAEV, Listeriosis and other health concerns will be of benefit to Australia.

Worm control strategies practised in France, particularly in grazing herds, are generally identical to those in Australia, as are problems with drench suitability and resistance. The importance of adequate drench doses, proper drenching strategies, and better nutrition for resilience to infestation apply equally to both countries. Developments that may have widespread benefit in the longer term, apart from drug research, include production of vaccines and use of a fungus predatory to worm larvae. Although genetic selection can be effective, it is likely to compromise more important breeding objectives.

Mastitis in French dairy goats is probably no better or worse than elsewhere, and is the major reason for culling. A considerable amount of work is being undertaken on defining target SCC levels for maximum milk production and quality, which in turn affect cheese yields. In the meantime, it appears that a bulk SCC threshold of 500,000, as measured by Fossomatic machines, will be an appropriate interim goal.

12.4 Genetic Improvement & Breeding

Probably the most valuable lesson for Australia are the achievements in genetic improvement of the French dairy goat herd. These have resulted from a systematic program, begun in the '60's and based on fundamental genetic principles, which has yielded not just increases in production per animal, but more importantly increased efficiency of production in terms of milk components that influence cheese yields and flavour.

Australia should follow the same path (identical to that used in our dairy cow industry) and implement a national genetic improvement program based on extensive milk recording, AI, and progeny testing of bucks. Appropriate selection objectives will need to be determined based on the intended major goat milk products. To expedite improvement, importation of French buck semen should be undertaken to introduce and spread the level of genetic merit in cheese production already achieved in France.

Techniques for the use of AI, and induction or synchronisation of oestrus, whilst more widely used in France, are the same as those known and used in Australia. Extension of these methods in Australia will be of great benefit in achieving a more consistent, regular supply of milk throughout the year.

12.5 Manufacturing

From observations of several French factories, Australian goat cheese manufacturers can be proud of their achievements. Operating in isolation in most cases, our cheesemakers have developed techniques similar to those developed in France over centuries. One factory visited was not highly mechanised and the manual handling of curd offered no revelations, whereas the attention to detail shown in on farm situations is also evident in Australian products, such as those from Kervella, Woodside and Gympie. The ready acceptance of Australian cheese at the Cheese Buffet is proof of this. Pre-ripening techniques used were of interest and it is probable that some advanced factories could be used as models for a more efficient, mechanised approach to making some of the simpler cheeses.

12.6 Milk & Product Quality

Payment criteria developed in France have potential application in Australia for underpinning milk quality of the highest manufacturing standard. Apart from purity criteria, such as residues and bacterial counts, and protein and fat content, such measures as SCC, immunoglobulin level and lipolysis rating have very significant relevance to Australia and should be considered sooner rather than later.

12.7 Marketing

There are considerable differences between the more traditional farms and larger modern farms. Markets for the smaller on-farm cheesemakers were farm gate and local street markets, and this is having to change. Local markets in the old part of town were once cheap places to shop, but supermarkets are now cheaper. Lifestyle changes include shopping habit changes too. Young shoppers and people with cars use supermarkets more. As noted elsewhere, even in this very conservative country, mass produced cheese is the sector showing growth. The traditional sector may be suffering less from the dreaded EU interference than from changes in shopping habits. A farmer organisation has expressed concern about growing customer sensitivity to food safety issues and the need to deal with these. Others within the industry expressed similar concerns.

Eating habits differ. It is not usual to cook with goat cheese in France. A book of goat cheese recipes was available at the Conference and we were told that this was a very new idea. Local producers agreed. In Australia, goat cheese is used widely in cooking (possibly its main use) and is a reason for the predominance of plain soft chevre.

Sensitivity to markets is high. As mentioned, terroir, or the influence of specific local conditions on product, is taken very seriously. One 'appellation controllee' region now prescribes grazing for goats, where housing had been practiced for some time. The French trade very much on perceptions of tradition and regionality, but also exploit other markets, which are growing rapidly. Exporters produce fetta, milk powder and ready-to-cook, prepacked cheese dishes which have very little French market demand. French packaging for goat cheeses (plastic containers and wraps) are used world wide.

The French 'scene' is diametrically opposed to the Australian experience where by far the great majority of cheese is automatically produced in large factories and purchased in supermarkets. Under these circumstances Australian goat cheese producers who are all small scale and manufacturing "specialty cheese" face the continuing challenge of introducing the reluctant public to the delights of cheese other than mild cheddar. The Australian Specialist Cheesemakers Association pursues this promotional activity to the extent of its resources, but without the assistance of the Australian Dairy Corporation in goat cheese promotion it is an uphill battle.



12. Reference

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