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## Sheep dairying in New Zealand - the Kingsmeade story

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### Abstract

Kingsmeade has been at the forefront of sheep dairying and innovative cheese-making practises in New Zealand since its inception in 1996. Breeding East Friesian sheep for temperament, type, and productivity has resulted in ewes, including hoggets, capable of achieving lactation lengths in excess of 250 days. A purpose-built factory on their 11-hectare Wairarapa farm currently produces 8.5 tonnes of sheep cheese annually. A further 8.5 tonnes of cow cheese is also produced on-site. Sustainable business practises have been created to ensure minimal wastage and environmental damage. Sales of cheese occur predominantly in the North Island and have been focused on long-term customer relationships by supplying smaller, more exclusive retailers and wholesalers with a unique, artisan product. Further expansion is dependent on acquiring local sheep milk producers. Export is planned with increased cheese production.

**Keywords:** East Friesian; cheese; sustainability

### History of Kingsmeade

Kingsmeade is a sheep-dairying and cheese-making business owned and operated by Miles and Janet King, and located 2 kilometres east of Masterton, Wairarapa (175°68'E, 40°95'S). It was one of the earliest farms in New Zealand to begin milking sheep following the selection and purchase of one hundred Coopworth cross Border Leicester ewes and their subsequent artificial insemination with East Friesian semen in 1996. Today, the progeny of these sheep make up the nucleus of the milking flock.

Kingsmeade initially began with the aim of providing fresh milk to a local cheese maker. A low-line herringbone milking shed, based on a goat-milking model, was built on the property to accommodate twenty sheep at a time. Within a few months of beginning milking, it became evident that it would be more profitable to make cheese on-site and a factory was built adjoining the milking shed.

To this end, Mr King, who at the time was also managing a large dry-stock property, taught himself to make cheese using the milk from the Kingsmeade ewes. Twelve months after the initial trial and learning period, retail production began. The cheese was marketed in New Zealand through local supply channels including farmers markets, wholesalers, restaurants and through the Kingsmeade shop, also located in Masterton and run by Mrs King.

At this time, Kingsmeade was the only farm in New Zealand making products directly from their own ewe's-milk supply and was quickly recognized as a producer of unique, high-quality artisan cheeses. As demand grew for the sheep's milk cheeses, it became apparent that in order to utilise the factory's full potential, Kingsmeade would need to produce more cheese. The milking flock had increased to almost double the original size (a maximum number for the land), but was unable to produce enough milk to accommodate the growing demand for the product. By this time, Mr King had decided to give up his farm

management employment and devote himself entirely to the business. Kingsmeade then began to supplement the cheese production by buying-in cows milk and creating a range of artisan cow's milk cheeses. In 2009, the factory size was increased three-fold to cope with increasing demand.

### Animal management

East Friesians were originally introduced into New Zealand in 1992, with the aim of improving this country's sheep industry by increasing ewe fertility and milk production (Allison 1996). They are generally regarded as the highest milk-producing sheep breed in the world with recorded milk yields of over 600 litres per lactation (Haenlein 2007).

Kingsmeade ewes are, however, pasture-fed animals, unlike many of their overseas counterparts which are commonly housed for the majority of the year. The Kingsmeade model also differs in that lambs are kept with their mothers for their first 6-8 weeks. After weaning lambs at an average 20 kg liveweight, each Kingsmeade ewe provides upwards of 150 litres for the remainder of lactation, which converts to approximately 8.5 tonnes of cheese per annum from a milking flock of 160 animals. This figure has increased steadily since the business began, as the cheese-making methods are continually improved and refined. An additional 8.5 tonnes of cow's cheeses are also produced on site.

In 2002 and 2003, Kingsmeade conducted out-of-season lambing experiments to potentially increase the milk supply to all year round. Natural matings in October and November were successful, but milk production following March/April lambing did not increase enough to create the volume of milk necessary for cost-efficient year-round cheese production.

Consequently, lambing now begins around 1 August and most cheese is produced from early-October until the flock is dried off in mid-April. After

10 years of milking twice-a-day, the decision was made to milk only in the afternoons, with the entire process taking between two and three hours. The business benefited from the decrease in milking expenses, and the ability to have a great deal more time to focus on cheese production.

The sheep are good natured and thoroughly accustomed to the daily milking routine. Seeds and Cereals (2000), Masterton, in collaboration with Vitec Nutrition Ltd, produce a formulated meal for Kingsmeade. Three hundred grams are fed to each ewe at milking. With this incentive, combined with positive handling from milking staff, hoggets adjust to the novel experience of the milking procedure within a few days. Older ewes that may have spent little previous time in the milking shed, not surprisingly, require longer periods to adjust. Murray et al. (2009) observed that milk production did not significantly decrease with poor ewe temperament. Nevertheless, sheep showing continual unacceptable behaviour upset the milking routine and are removed from the milking flock at the earliest occasion.

Trained milking staff closely monitor ewe health and behaviour. Ewes are drenched twice a year, usually outside of the milking season. If it is necessary to drench any ewe during milking, milk obtained from within the withholding period is frozen to later support orphaned lambs. If required, only antibiotics with no requirement for withholding milk are administered to milking ewes.

Breeding of mixed age (MA) ewes begins on 8 March. The flock is divided into three groups and are single-sire mated to rams for a minimum of three reproductive cycles. Rams are fitted with crayon harnesses and are rotated between flocks after each cycle. The Kingsmeade breeding rams are usually selected from the farm's own lambs with outside rams introduced every third year. However, this practise has become increasingly difficult over time as it has become more challenging to find rams from a milking herd in New Zealand that management consider superior to the Kingsmeade animals.

Dry ewes are grazed off the property, returning immediately prior to the start of lambing on 1 August. Lambs are tagged at birth. Dam, sire, date of birth, litter number and sex are recorded. Birthweight was recorded for the first time in 2013.

Ewes that rear only one lamb are brought through the milking shed daily with lambs at foot from one week of age and excess milk removed. Before this practise began, ewes with single lambs would not enter the milking flock until weaning, and typically would be the earliest in the flock to dry-off. Presently, no difference is noted between their drying-off dates and those from multiple-bearing ewes. Similarly, ewes that abort up to three weeks before their due lambing date and ewes that no lamb is available for mothering-on, are milked daily and lactation lengths are identical to the flock as a whole.

Ewes raising multiple-birth lambs begin daily milking immediately after weaning. Lambing

percentage (number of lambs reared to weaning/number of ewes mated x 100) is 120-140% for hoggets and 180-200% for mixed-age ewes. Older ewes are capable of rearing triplets successfully, although one lamb may be removed to a ewe that has lost its own offspring. Any lamb unable to be mothered-on is hand-fed using sheep milk. The majority of male lambs are sold as milk-fed lambs at an average weaning weight of 25 kg.

Ewe lambs are grazed off-property. Selection into the milking flock is based on a number of criteria, including the general good health and temperament of the lamb, and longevity and productivity of her dam. Particular emphasis is placed on breeding for ewes with capacious, strongly-attached, well-carried udders with teat size, shape and placement desirable for both lamb-rearing and machine milking, similar to as described by Rovai et al. (2004). Between 30 and 35 ewe lambs are retained as flock replacements. Single-sire mating begins on 8 April for a minimum of three reproductive cycles. A harnessed ram lamb is changed after each cycle. The remainder of ewe lambs are usually sold to other farms as breeding stock. Kingsmeade ewes are typically milked from one to seven years of age.

In the near future, Kingsmeade plans to purchase milk from two local independent milking flocks, derived from Kingsmeade stock.

## Environmental considerations

The 11-hectare farm is some of the most fertile land in the region. The soil type is free-draining Greytown Silt Loam. Soil Olsen P level is 25 and pH is 5.9-6.0. Average rainfall is approximately 1200-1300 millimetres per year, and this is fairly evenly distributed. However, a dry spell is normally experienced between mid-December and mid-March, exacerbated by the prevailing north-westerly winds. The 17 flat paddocks are extensively planted with Poplars, Tree Lucerne, Italian Alder and *Pittosporum Ralpii*. All were planted for shelter, and some also for supplementary fodder. Minimal irrigation from the farm's bore occurs when necessary. Pastures are predominantly ryegrass and white clover, with some specialist planting of chicory, plantain and lucerne.

The delicate balance between the environment and production is an important component of any artisan business. Sustainability is crucial with Kingsmeade taking a preventative and pro-active rather than reactionary approach. Kingsmeade has taken great care to create sustainable business practices with as little wastage and environmental damage as possible.

Other than meal, no bought-in supplements are fed. The land is purposefully not overstocked, and great care is taken to shift sheep if there is any risk of pasture damage. This is often not an easy task, as suitable land is not readily available in the area. A focus on high per-animal rather than per-hectare

performance can be seen in the prime health, placidness, and output of the Kingsmeade sheep.

In recent years, Kingsmeade has been awarded the Taste New Zealand Farmer's Market Dairy Producer of the Year Award, the Greater Wellington Region Ballance Farm Environment Award, and the Mindfood Award for Sustainable Business Practices.

## Products and marketing

Currently, Kingsmeade produces 14 different cheeses, eight of which are made from ewes milk, five from cows, and one blend of both. The sheep milk cheeses are delicate and sharp in flavour and are usually very white in colour. Contrary to some people's understanding, sheep milk cheeses do not have the unpleasant flavour of some goat milk cheeses. Promoting the Kingsmeade product has, therefore, partly been an exercise in educating consumers.

After milking, the sheep's milk is stored in a temperature-controlled vat, collected until there is 300-400 litres, pasteurised using the batch pasteurisation method (which is reputed to be better for making cheeses) and then immediately made into cheese. Whey is collected by a neighbouring pig farm.

The Kingsmeade cheeses range from the very soft and creamy types, to distinct blues and aged, hard varieties. The maturation times can vary anywhere between three weeks and two years. The factory is operated under strict temperature, hygiene and practice codes as set by the Ministry of Primary Industries (MPI), and audited by Eurofins. Initially, auditing was every 3-4 months, but now that Kingsmeade has been consistently operating under exemplary hygiene standards, factory auditing is annually. Eurofins also require audits of milk and cheeses every month.

After the cheeses have matured in specially regulated chillers, they are portioned and packaged in the factory and then transported off-site to the Kingsmeade retail shop where they are labelled and sold directly to the public or distributed to order.

The cheeses are currently sold throughout New Zealand, predominantly in the North Island. The marketing strategy is developing demand for an exclusive artisan product. Initially, it was the objective to supply to large supermarkets and bulk distributors, in order to capture large volumes of customers. Soon after, it was determined that this approach was detrimental to the artisan nature of Kingsmeade, and the focus was then shifted to target smaller, more exclusive retailers and wholesalers.

It was felt important to retain the link between the producer and the public, so a great deal of attention has been paid towards garnering strong one-on-one contact between Kingsmeade cheese makers and the customers. The authors experience is that Farmer's Markets are the perfect environment for this personal interaction and Kingsmeade is popular in markets in Masterton, Martinborough and Wellington for this reason.

Kingsmeade has also established successful business relationships with local vineyards and often participates in companion wine and cheese tastings throughout the Wairarapa. At present, it has become apparent through customer demand that there is also an emerging marketplace for non-cow dairy products. It seems that sheep's cheeses and milk can be tolerated by a large number of customers. Health food shops, in particular, are keen to stock these products, including sheep's milk and yoghurt. This is an increasing focus for the marketing of Kingsmeade products.

The Kingsmeade farm, business model and cheeses are frequently featured in food magazines, national newspapers and television shows. Customers and stockists have responded very well to the fact that Kingsmeade is an environmentally responsible, sustainable business which is locally owned and operated.

A strong emphasis is placed on the Kingsmeade's branding. All the marketing material and each of the cheese labels and are based around local flora and place names. The New Zealand public and tourists have responded very well to this strategy. The farm and retail outlet is frequently visited by foreigners and locals, curious to see the milking and taste the cheeses. The sheep are accustomed to and respond well to strangers.

Kingsmeade cheeses have been awarded numerous medals in the New Zealand Cheese Awards in the last 12 years, frequently for the sheep's milk cheeses. These accolades, along with the numerous environmentally conscious awards and the publicity surrounding them have had a significant impact on the success of Kingsmeade's reputation as not only the producers of high-quality gourmet cheeses, but also as an exemplar of animal and environmentally friendly business practices. They have also helped to foster long-term customer relationships with reputable restaurants and high-end lodges nationwide.

## Where to from here?

The cheeses of Kingsmeade are constantly evolving. Great care is taken to perfect and improve every batch. Likewise, new cheeses and products are regularly being considered and developed. Opportunities have arisen to learn from skilled cheese makers from all over the world. While Kingsmeade cheeses are largely derived from trial and learning, influence and experience from the European sector has been particularly valuable in producing cheeses largely unknown to the New Zealand marketplace. Kingsmeade continues to strive to create cheeses which create a point of difference from competitors.

The development of the Kingsmeade flock is a priority. The reputation of Kingsmeade stock is built around their calm and friendly temperament, good health, longevity and extended milking seasons.

In 2014 a sire-proving scheme will be implemented in conjunction with another New Zealand sheep dairying project with the first results expected in

two years. If successful, dairy-sheep productivity should increase significantly throughout New Zealand, and potentially increase the demand and value of Kingsmeade stock. Bulk tank milk testing has already begun, and herd testing will begin in the 2014-2015 season. The results of this scheme may also entice more New Zealand farmers into the sheep milking industry, which could benefit not only New Zealand farmland but also solve the sheep milk shortage which has been causing significant delays to the expansion of Kingsmeade cheese production.

In the near future, Kingsmeade is looking to increase cheese production and begin international marketing commencing in Australia.

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