



Review

The dairy goat industry in Norway: Challenges in a historical perspective[☆]



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ABSTRACT

Norway is a small country in population (5 million), but with a rather large area. There are only 33,000 dairy goats left in the country, as opposed to many more a hundred years ago. Milk is used mainly for production of brown whey “cheese”. However, ordinary white cheeses are the expanding market for goat milk. Therefore, quality of casein becomes a more important issue. Taste and coagulation properties of milk have been drastically changed during the last 10–15 years. One reason is a reduction in the prevalence of a mutation in CSN1S1. This mutation was seen so far only in Norwegian goats. The mutation is a deletion in exon12 and leads to higher concentrations of free fatty acids and poorer coagulation, probably due to reduced content of α S₁-casein in the milk. Additional reasons for changes in milk quality are: (i) improvement of the nutrition of dairy goats, which include higher proportions of fat in concentrates in the diet and (ii) a project that has got rid of CAEV in the major part of the goat population of Norway.

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An Old Norse text, Hávamál, says that who owns a small dwelling and two goats does not need to beg: ‘who owns two goats and a hall with rope strung roof is better off than begging’:

þótt tvær geitr eigi

ok taugreftan sal,

þat er þó betra en bæn.

(Anonymous, 1200–1300) (verse 36).

1. Introduction: goat origins, numbers and production

Of the Norwegian mainland area (323 731 km²) only 3% is farmland. Including the Norwegian territories in Svalbard and Antarctica certainly decrease this proportion. About 37% of the mainland area is forest (SSB, 2014), and most of the rest is mountainous rangeland above the forest line, and only part of this land can be used for grazing in summer. Rangeland has traditionally been an important resource for farming. Nowadays, the importance of rangeland has decreased due to high salaries and living expenses compared to prices for chemical fertilizers and imported feed. Feed grown closer to the farm and purchased feed concentrates replace rangeland feed. Goats are famous for their ability to climb mountains and for exploiting alpine pastures. However, in order to produce milk in commercial quantities, they have to be supplemented with concentrate feed. In Norway, pastures are only available during the 4 months of summer. Some farmers are still keeping

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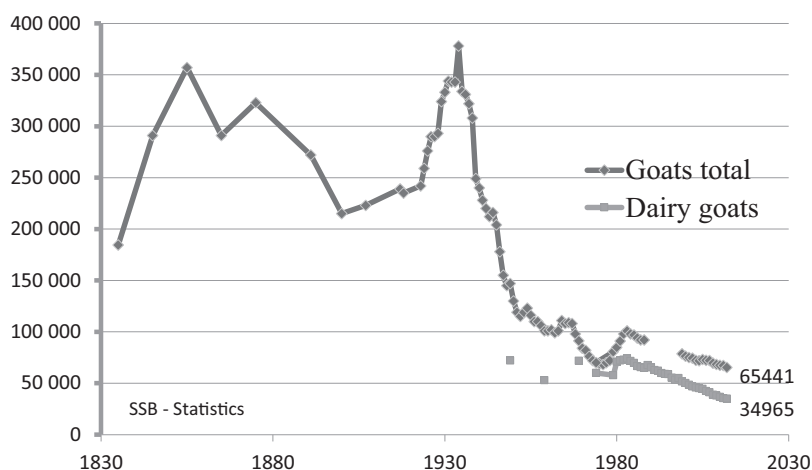


Fig. 1. Goats in Norway 1835–2012 (SSB, 2014).

the tradition of exploiting the alpine range during 1–3 of the summer months. All goats are mostly fed grass silage and concentrates indoor most of the year. Kidding of dairy goats in Norway is in January–March, which coincides with peak production of milk in May. Very little milk is produced during November to January. Meat production from dairy goats or their kids in Norway is a negligible source of income. As most types of agriculture in Norway, dairy goat farming is subsidized. The subsidies are mainly based on the number of goats per area, or as a contribution for grazing, – not on the amount of milk produced. This acknowledges the role of goats in preserving the landscape by avoiding excessive encroachment of bushes and trees, particularly in tourist and recreation areas. However, it is not easy to combine use of goats for land control with high milk production. Within Norway, dairy goat farms are concentrated around Troms County in northern Norway, and in the northwestern part of southern Norway. Typical dairy goat farms are small and often located near fjords surrounded by steep mountains.

Norwegian dairy goat farming has long traditions, going back at least to the Viking times. The goats of Iceland may have been brought there during the Viking times from Norway. The Norwegian Dairy Goat landrace is the only goat breed that is used to produce milk for human consumption in Norway, with few known imports of foreign genetic material. Recently (2007 and 2011), semen of French Alpine bucks has been offered for sale to Norwegian Dairy Goat owners and this may affect the characteristics of the breed. The current IGA president, Juan Capote, recommended to protect the ancient Norwegian goat breed in order to preserve their unique characteristics (pers. comm., Tromsø, June 2013). Most goats of the Norwegian breed are not uniformly colored and are born with horns, which are removed at an early age.

The number of goats has been steadily decreasing during the last 80 years to the present 33,000 (SSB, 2014). According to official statistics, the numbers of goats (including both dairy and other types of goat) were around 350,000, in the late 1800s and in the 1930s (Fig. 1). Although the number of dairy goats has been decreasing,

the milk production in Norway has been fairly stable over the last two decades, amounting to around 20,000 tons per year, equivalent to no more than 4 kg goat milk per year and inhabitant. A quota system, which was instituted in 1983 has limited milk production per farm. Subsidies have been partly given per head of goat, so production capacity of each goat has not been fully exploited. Average annual milk production for goats in the Dairy Goat Control system in 2012 was 716 kg per year with 4.04% fat, 3.09% protein, and 4.35% lactose, or approximately 85.9 kg dry matter. Of all dairy goat herds, 87.7% are members of the Dairy Goat Control (Tine, 2013). Only 13% of calculated milk production is not delivered to dairies. This milk is used for fostering kids and in a few cases for making cheese on-farm. Approximately 800 tons of milk per year is used for farm cheese production, some of it from goats which do not belong to the Dairy Control system (Kvamsås, 2013).

According to official statistics, the number of dairy goat farms is also quickly declining, from 700 in 2000 to 320 farms in 2013, but average herd size is increasing and is now 103 goats (SSB, 2014).

Since the 1850s (SNL, 2009; Kismul and Volden, 2013) dairies in Norway have been cooperatively owned by farmers (SNL, 2009; Kismul and Volden, 2013). The farmers have the right and an obligation to deliver their milk to these dairies. Some milk products are sold from a few of the farms during the summer season, but throughout-the-year local production is rare.

2. Goat milk products

Whey 'cheeses', which are processed by heat evaporation of whey mixed with milk and cream, resulting in caramelization of lactose (Skeie, 2014), are the main products from goat milk in Norway. About 70–80% of the goat milk is used for the 'Gudbrandsdalsost' that is made mainly from cows' milk mixed with some goat milk, and for 'Ekte geitost' composed of only goats' milk with a more pronounced goaty flavor. Another product is 'Snøfrisk', a cream cheese produced by a combination of acid and rennet coagulation (Skeie, 2014), that comes from 6% of the goat milk

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