Novel strategy to optimise productivity in dairy sheep

Dairy sheep nutrition directly influences milk solid content, which is an important factor for cheese yield from sheep milk. However, the current economics of dairy sheep production are driving the need for increased milk production in ewes, which generally negatively impacts milk composition.

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In the following case study, we discuss how a gut agility activator adds value to feeding strategies designed for high productivity in Lacaune dairy sheep.

The Lacaune sheep is one of the most important dairy sheep breeds in the world. It originates from the Roquefort area of Southern France but is widely distributed in many countries today.

It produces milk with a high milk solid content and has become one of the world's highest milk-producing sheep breeds by way of a large-scale French selection programme.

The milk from Lacaune sheep is mainly used to produce cheese, among which the most famous produced is Roquefort cheese, which is a blue cheese.

High potential to improve profitability

Several recent studies evaluating the economic viability of dairy sheep production in different parts of Europe concluded that many sheep farms could substantially improve their profitability and their competitiveness by increasing productivity in dairy ewes, particularly on semi-extensive farms.

In Greece, 37% of dairy sheep farms with ‹150 ewes and 31% with ›150 ewes were operating with economic losses.

Others comparing break-even analysis of sheep milk production across France, Greece, Italy and Spain reported that most Greek and French dairy sheep farms were operating at losses.

A similar trend was seen in Slovakia. The problem being that whilst costs for production are significantly increasing, productivity per ewe and milk/cheese revenue is changing minimally in many cases.

Feeding cost was reported to be the biggest expense (45%) followed by labour costs.

The efficiency analysis of 60 semi-extensive French dairy sheep farms revealed that efficient farms achieved higher milk yields (51l per ewe per lactation period), having the same feeding cost (€67/ewe) and almost the same fixed capital cost (around €200/ewe) when compared to inefficient farms.

This indicates that ways of increasing milk yields in ewes, plus strategies for improved feed efficiency, are required to become more profitable.

Adopting best practices for nutritional management, improving feed efficiency and the willingness to take up innovative solutions related to digital technologies were named as key to improving productivity and sustaining profitability on dairy sheep farms.

Feed efficiency values in dairy sheep have been found to vary from 0.3 to 1.0kg of milk/kg of dry matter intake.

Feeding for processing performance

Sheep milk is superior for cheese-making because it contains higher levels of total solids than cow and goat milk. The processing performance of sheep milk is normally affected positively by its fat and protein content and negatively by its somatic cell counts.

Milk fat and protein contents are routine parameters to predict cheese yield. In Lacaune sheep, total utilisable substances (TUS) have been found to be an accurate predictor of Roquefort cheese yield and are calculated as the sum of the fat and protein content in milk, expressed in g/l.

The synthesis and rates of secretion of milk fat and total protein as well as somatic cell count (SCC) of milk can be impacted by nutrition.

As a result, nutrition plays a major role in the processing performance of the milk, including milk clotting properties, cheese yield, ripening time and preservability of cheese.

However, it is challenging to optimise milk composition and at the same time increase milk production by means of nutrition because milk yield and milk composition are

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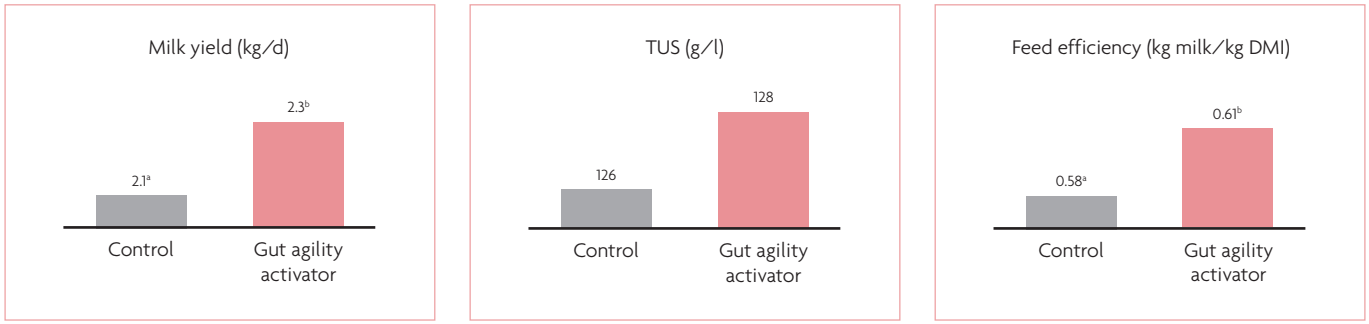

Fig. 1. Performance parameters in ewes in response to the gut agility activator in the diet.

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negatively correlated. A recent French study reported positive effects on milk production and feed efficiency in dairy ewes without compromising milk composition in response to a gut agility activator in the diet. The gut agility activator had previously shown to increase milk yields and milk fat and protein content under various European commercial conditions in dairy cows.

Case study in Lacaune dairy sheep

The study was carried out in collaboration with the Agricultural School of La Cazotte in France involving 80 multiparous lactating Lacaune dairy ewes.

The control diet used was a standard diet mixture which consisted of forage (1/3 grass silage, 1/3 corn silage, 1/3 alfalfa hay) ad libitum and 1.55kg/day as-fed concentrate feed.

The treatment group received a gut agility activator, including a formula based on a synergistic blend of botanical compounds, which was supplemented via the commercial concentrate from one month post-partum to 4.5 months post-partum. Measurements included milk yield, milk fat and protein content and feed intakes.

Total utilisable substances (TUS) were calculated from the sum of milk fat and protein content.

Results showed a significant increase in milk yield by 10% in response to the gut agility activator whilst maintaining the same levels of fat and protein in the milk (Fig. 1). This led to a significant increase in milk solid yields.

Furthermore, feed efficiency was significantly improved in ewes fed the gut agility activator (Fig. 1) and ewes produced 5.3g more TUS/kg DMI.

The gut agility activator appeared to be an effective solution to enhance the diets of dairy sheep to support increased productivity and efficiency in the production of milk with high processing performance for cheese production. ■

References are available from the author on request