

Efficiency in Dairy and Meat Cattle Nutrition: Principles and Modern Understanding

Mariana Petkova*

Department of Animal Nutrition and Feed Technology, Institute of Animal Science Kostinbrod, Bulgaria

***Corresponding Author:** Mariana Petkova, Department of Animal Nutrition and Feed Technology, Institute of Animal Science Kostinbrod, Bulgaria.

Received: April 14, 2017; **Published:** May 11, 2017

“In the beginning was the Word” – it is in the religion, but at the animal nutrition – the feeds fall during the beginning. According to FEFAC [1], the EU-28 produced 155 million tonnes of compound feed together in 2015. And more – animal husbandry consumed 478 million tonnes per year (2015) including 233 million tonnes roughages and 245 million tonnes concentrates.

In Bulgaria, and around the world, the quality of feeds is key factor for level of animal production and health. To determine the nutritional value of the feeds and of their quality, there are two basic types of analytical methods - chemical and biological. Weenden’s system (chemical methods) is the classic method of feed evaluation: the animal is seen as a black box and the focus is on the total track digestibility. Feeding values are as an additive.

The new evaluation systems (feed and/or protein) usually used fractional composition of basic nutrients (saccharides, crude protein, and fat); the digestible ‘Weende’ nutrients as a basis and additivity are skipped, and the potential digestibility and fractional rate of degradation for several nutrients are required. Recent research indicates that models with a more mechanistic approach to describe truly digested nutrients are developed. Good examples of the new feed and protein evaluation systems are: French protein system (PDI); Duch protein system (DVE/OEB); Nordic feeds system (Nor-For™); Danish feeds system; German feeds system; CNCPS (USA) and other countries used some of those systems modified. Ruminal degradability (estimated by *in situ* or *in vitro* methods) and intestinal digestibility (estimated by mobile bags or ensimatic *in vitro*) are the two main indicators in the new evaluation systems.

What represents the effective nutrition? Objective of modern agriculture is preservation and rational utilization of feeds and by-products in line with protection of environment. The animal nutrition has an important position in the complex of food chain (soil – plant – animal – feeds). More effective utilization of feeds and by-products by animals decreases costs for feeds production and decreases excretion. At farm level it is the general assured with feeds (produced and purchased) as well as the milk yield/ dry matter (DM) intake. General principles of efficiency at the animal nutrition are: how well are rations balanced and what is the implementation of a balanced ration? And all it starts with the level of dry matter consumption.

It is very important to improve efficiency of nutrition of dairy cattle. Hutjens’s [2] advise is very clear: optimally, the milk yield have to be in the range of 0.635-0.816kg Fat Corrected Milk/kg DM intake. Efficiency is affected by the days in milk, age, growth, changes in body condition score, body weight, and forage quality. Feed additives and environmental factors that impact feed efficiency values can influenced the improving the efficiency. Between feed efficiency and profitability has positive relation and improving the first one almost always improves the second one. In the world of milk the feed efficiency is an indicator in which the regions are compared. It is defined as good if its values are > 1. Globally it means yield 1.1 kg Energy Corrected Milk/kg feed DM. Farms in European countries and North America have feeding systems based on grain and silage and distinguished by the highest values of this index - 1.63, while Africa, with rations based mainly on grass forage has 0.43.

The efficiency of meat cattle nutrition is affected first of all by the type of the breed [3]: veal calves (dairy breeds – Holstein, Simmental), early fattening (British beef and dairy breeds), late fattening normal muscle (Limousine, Aubrac, Salers, Charolais, Chianina, Romagnola, Marchigiana) or late fattening double muscle (Blonde d'Aquitaine, Piemontese, Belgian Blue, Gasconne). Each breed has specific nutritional requirements (for energy and protein) and as a result - specific physiology of growth. The nutrition is composed mainly by roughage: green grass, corn silage, silage of cereals, grass silage, haylage, hay and straw. Adequate chopping length of fiber is very important: for corn silage, it is in the range of 0.9 to 1.9 cm; for grass or alfalfa silage – 2 - 4 cm. Practicing intensive rotational grazing, optimally is to move 70 to 90 animals through paddocks of 5 - 7 acres each. Concentrates (cereal grains, protein sources, waste products etc) participate in the ration also and have complementary role. All grains must be milled: corn grain – 2 - 3 mm; wheat/barley – 4 - 5 mm.

In conclusion, the efficiency of dairy and meat cattle nutrition will continue to deliver solutions to a sustainable livestock sector and to evolve as a management tool and as a key indicator for modern milk and meat production.

Bibliography

1. FEFAC, Annual report (2015-2016): 1-24.
2. Hutjens MF. "Dairy Efficiency and Dry Matter Intake". Western Dairy Management Conference (2013).
3. Necula C and Alltech RO (2016).

Volume 8 Issue 6 May 2017

© All rights reserved by Mariana Petkova.