

Study of the remnant effect of the environment during the growth period on milk yield efficiency in dairy cows

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SUMMARY

The study is based on the scientific statement that the phenotype is a reflection of the genotype/environment interaction; starting from this, the determination of the remnant influence (as a residual effect of the environment) of the inadequate feeding levels for young female cattle on their growth, feed utilization efficiency and milk production levels at adult age, was attempted. In order to show this effect, equations (presented in the paper) were developed for the calculation of the feed ingestion capacity (digestive capacity) expressed as dry matter (DM) and the energy intake for maintenance and for various milk production levels in cows of 350 to 700 kg weight. Assuming that the energy concentration (EC) in the diet remains constant, the energy amounts which can be ingested were calculated, as also the milk productions which these energy amounts can yield. The calculations also took into account (1) the effect of live weights on animals capacity of creating and using body reserves for maximum milk productions, and (2) the estimated milk production levels. The study led to the following conclusions:

The lowering of dairy cows' body weights, as a remnant effect of inadequate feeding during the growth period, was followed by lowered energy requirements for maintenance, but also by reduced feed ingestion capacities which require higher EC values in the diet;

When calculating the dietary energy utilization for milk production at similar production levels, cows of lower body weights were found to have lower specific intakes; this requires, however, higher dietary EC values, i.e. higher proportions of concentrated feeds in the diet. For a daily milk production of 20 l, 350 kg cows should receive diets with cca. 20 % bulk feeds and 80 % concentrated feeds, while 700 kg cows may receive diets with only cca. 17 % concentrated feeds and 83 % bulk feeds;

When using in the calculations the same dietary EC value as that necessary for a daily milk production of 20 l in 350 kg cows, 700 kg cows were found to be able to ingest an amount of energy which allowed a daily milk production of 43.8 l. The specific intake was also lower in 700 kg cows;

When taking into account animals' capacity of creating and using body reserves, 350 kg cows were found to be able to ingest energy amounts which allowed daily milk productions of 30.5 l, while 700 kg cows can yield up to 65

l of milk per day. These conclusions point out the fact that it is only by an adequate feeding of female young cattle that high-yielding adult cows can be produced. '

Keywords: dairy cows, dietary energy utilization, milk yield