



REGULARITIES OF ACCUMULATION OF NITRATE-NITRITIC NITROGEN IN LIVESTOCK PRODUCTS



P. Khirivsky, V. Snitynsky, Y. Korinets

Lviv National Agrarian University, Lviv. Ukraine

Introduction

- An important role in increasing the production of fodder and food crops is given to the chemicalization of agriculture. The intensity of the use of nitrogen fertilizers has become increasingly practical, as it promotes crop growth, increases the content of crude protein, carotene, etc. in feed and, accordingly, increases the productivity of animals
- At the same time, the use of high doses of nitrogen fertilizers, non-compliance with the technology of introducing them into the soil under plants, is accompanied by the appearance of excessive amounts of nitrates in feed, feeding which often caused toxicosis in animals, and causes their presence in livestock products.
- The great danger was that nitrates-nitrites are also harmful to humans when they are converted into livestock products.
- The issue of obtaining environmentally friendly livestock products (especially milk for dietary nutrition) is acute. The conditions under which these products can be obtained free from pollution by nitrate-nitrites have been insufficiently studied.

Results

According to the obtained data, the ten-day increased intake of nitrates in the body of cows in the feed ration led to a clear increase in the content of nitrate-nitrite forms of nitrogen in milk and urine. Compared with the control (without feeding nitrate additives), the concentration of nitrate nitrogen in milk and urine of experimental animals was two or more times higher. Moreover, in experimental animals in the milk of early milking the content of nitrates was lower than in the milk of lunch or evening milking. The largest proportion of non-metabolized nitrate was excreted in the urine, much less - in milk. When determining the daily dynamics, the highest level of nitrate in milk and urine, due to exercise, was recorded for 4-6 days of the experiment. Prior to that, it gradually grew. In the period between the 7th and 10th day there was a marked decrease in the content of nitrates in milk. Perhaps this is due to the adaptation of the body of experimental animals. As for urine, a similar decrease in nitrate levels was not detected during this period.

In the control during the experiment, the concentration of nitrates in milk and urine fluctuated within narrow limits, creating an almost straight line in the graphical image.

Regarding the content of nitrite ion in milk, in the control its presence was detected only in trace amounts (0.001-0.009 mg/l). In the milk of experimental cows, their level was significantly higher and increased from 0.005-0.01 mg/l on the first day of the experiment, to 0.021-0.042 mg/l on day 4-5, as well as in the following days with some fluctuations.

According to the content of residual nitrate in the tissues of the studied organs of cows taken at slaughter after the end of the body load with sodium nitrate, there were a number: spleen, heart muscle, liver, lungs, longitudinal abdominal muscle, bile. Without feeding nitrate supplementation, its level in the studied organs was 3-7 times lower, and was 0.1-0.6 mg NO₃-/l. Moreover, nitrite was practically not detected, while in experimental animals their content ranged from 0.099-0.176 mg / kg, except for bile, where it reached a much higher level.

Material & Methods

Studies were conducted on dairy cows in the winter-stable period by the method of groups-periods. The experimental groups received with feed sodium nitrate in doses of 2 and 5 MPC. Sampling was performed during morning and evening milking. the content of nitrate-nitrite nitrogen in milk was determined using the Griss method.

Conclusions

Thus, unequal cumulative growth of nitrate and nitrite levels and their ratio in the studied tissues of organs and biological fluids caused by loading of cows with sodium nitrate were established. The presence of a positive correlation between the degree of loading and the levels of nitrate-nitrite forms of nitrogen in tissues and biological fluids was confirmed.