

## USE OF HOP CONES AND VITAMIN E TO PREVENT METABOLIC DISORDERS IN TRANSITION DAIRY COWS

*S. Sachko, I. Vudmaska*  
ivvudmaska@gmail.com

Institute of Animal Biology NAAS, Lviv, Ukraine

After calving cows get into negative energy balance accompanied by glucose deficiency and excessive release of fatty acids from adipose tissue. In assessing the metabolic status of cows during this period, the focus is on the violation of carbohydrate and lipid metabolism, but such important aspect as the ammonia intoxication, what is one of the factors of liver degeneration remains often out of attention. The main contribution to the formation of ammonia in the rumen is performed by gram-positive hyper ammonia producing bacteria (HAB). The activity of these bacteria is inhibited by ionophore antibiotics that are prohibited for use as a feed supplement in the EU. The substitute for antibiotics may be hop cones contained substances that selectively affect gram-positive bacteria, including HAB. However, ionophores inhibit cellulolytic bacteria activity too. High doses of dietary vitamin E can stimulate fiber degradation in the rumen. The purpose of our study was the possibility of use hops cones and vitamin E as a complex for prevention of metabolic disorders in the transition cows.

The experiment used twenty Ukrainian dairy black-and-white breed cows; milk yield 6000–7000 kg for previous lactation; divided into two groups 10 animals each. The 1<sup>st</sup> group is control. Diet of the 2<sup>nd</sup> group was supplemented with (per kg DM) 1 g of dry hop cones and 300 mg of  $\alpha$ -tocopherol acetate as a 0.6 g of *Rovimix E-50* (NRC 2001 recommends 80 mg/kg for dry cows and 30 mg/kg for lactating cows). Experiment lasted during transition period (from 3 wk prepartum until 3 wk postpartum).

Supplementation the diet with hop cones and vitamin E has affected rumen fermentation. In particular, the feed additive stimulated cellulolytic and suppressed proteolytic activities ( $P < 0.01$ ). As a result, the concentration of ruminal volatile fatty acids was increased. Reduced proteolytic activity led to a decrease in ammonia concentration in the rumen ( $P < 0.05$ ). At the same time, the amount of microbial nitrogen in the rumen of the experimental group of cows has moderately increased, what indicates the absence of depress effect of the additive on the rumen microbiota in general. The feed supplement reduced the concentration of lipid oxidation products ( $P < 0.05$ ) in the blood of dry cows, without affecting other parameters. After calving, changes that are more significant were detected. In the blood of cows of the experimental group an increase in the concentration of glucose ( $P < 0.05$ ), triacylglycerols ( $P < 0.05$ ), cholesterol esters ( $P < 0.05$ ), and a decrease in the concentration of NEFA ( $P < 0.05$ ), TBARS ( $P < 0.05$ ), and beta-hydroxybutyrate ( $P < 0.05$ ) were found.

Consequently, supplementation the diets of transition cows with 300 mg of  $\alpha$ -tocopherol acetate and 1 g of dry hop cones per kg of DM stimulates the synthesis of glucose by the liver, reduces the intensity of release of fatty acids from adipose tissue, suppresses peroxide oxidation and reduces the concentration of ketone bodies in blood. Proposed feed supplement can be used to prevent metabolic disorders in cows.

**Keywords:** TRANSITION COWS, HOP CONES, VITAMIN E, RUMEN, BLOOD