

models. Clearly, substantial gaps remain in our knowledge of the intricacies of hydrogen flow within the ruminal ecosystem. Further characterisation of the fundamental microbial biochemistry of hydrogen generation and methane production in the rumen may provide insight for development of effective strategies for reducing methane emissions from ruminants. There has been an investigation yet, which not only covers energy efficiency, but also the extent of feed digestions.

Approach: The hypothesis will be tested using the following integrated approach: (1) establishment of biodegradable and digestible feeds and rations characteristics; (2) investigation of the rumen fermentative pattern under a wide range of conditions (feedstuffs, diets). Rumen degradability will be compared with intestinal (duodenal, ileal) digestibility. In addition, ruminal fermentative parameters NH₃, VFA, pH will be assessed. Special attention will be paid to the shift of rumen fermentation from an acetate dominated profile of VFA to a propionate dominated one. Besides might shift the excretion of N from the faeces to urine. Also, the fatty acids profile of milk will be assessed as an alternative tool to monitor rumen fermentation, including CH₄ production; (3) examine *in vitro* CH₄ and CO₂ productions under wide range of conditions (feedstuffs, diets). The validity of the results will be assessed; (4) redirection of rumen fermentation to reduce methanogenesis will be validated. A new approach, based on using cell fractions as opposed to whole cells, will be used; (5) finally, the contribution of the all these parameters aiming to reduce the emission of methane and other GHG from dairy cows should be integrated and implemented at farm level rather than at animal level. The current HOLOS model offers sufficient scope to evaluate methane mitigation options.

M. ПЕТКОВА

Викладено основи забруднення навколишнього середовища жуйними та шляхи можливого скорочення метанових викидів.

CZU 631.153:636.22/.28

EFFECT OF FEEDING WHEAT DDGSS TO WEANED PIGS ON PERFORMANCE AND BLOOD SERUM CHOLESTEROL

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The objective of this experiment was to study the effect of inclusion of 20 % wheat dried distillers grain with solubles in diet on weaned pig performance and blood cholesterol concentration.

Twenty six weaned pigs cross-breed Youna (initial body weight 13,8 ± 0,06 kg) with two replicates were randomly allocated to two experimental

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groups for six weeks. The experimental design consisted of two dietary treatments:

- 1) control diet – standard compound feed;
- 2) experimental diet – with wheat DDGS, at a level of 20 % in the diet. Individual pigs' body weights were recorded every second week. Feed intake and feed conversion rate were determined every second week per group. At the end of the experiment blood samples were collected from the pigs to determine total serum cholesterol concentrations.

The results of this study have shown that the inclusion of 20 % wheat dried distillers grain with solubles in diet for weaned pigs improved average daily gain by 7,6 %. Feed conversion rate was improved by 9,6 %. The experimental group has increased total serum cholesterol by 29,3 %.

The rapid growth of the bio-fuel industry has as result production of a large quantity of by-products that can potentially be used as feed ingredient in swine diet. Distillers dried grains with solubles (DDGS) is a by-product resulting from the fermentation of cereal grains for the production of alcohol for fuel or beverage.

Significant amount of research has been conducted to evaluate the effect of DDGS on weaned pig performance. The results differed among studies. Burkey et al reported that the inclusion of 5 % DDGS from 8 to 21 day after weaning and 30 % from 22 to 42 day affected performance negatively. Other experiments have shown that dietary levels up to 30 % did not influence pig performance.

Recommended maximum inclusion rates in diet for weaned pig are:

- corn DDGS – 30 % (Leman, 2008)
- wheat DDGS – 10 %.

The objective of this studies was to evaluate the effect of feeding wheat DDGS to weaned pigs on performance and blood serum cholesterol.

The experiment was conducted in the experimental base of the Institute of animal science – Kostinbrod, on pigs from our own farm. Twenty six weaned pigs cross-breed Youna (initial body weight $13,8 \pm 0,06$ kg) with two replicates were randomly allocated to two experimental groups. The experimental period was six weeks. The experimental design consisted of two dietary treatments:

Control diet – standard compound feed;

Experimental diet – with wheat DDGS, at a level of 20 % in the diet. The diets are aligned in nutrient content. The feeding was *ad libitum* for the whole experimental period. Pigs had free access to water by nipple watering trough.

During the experiment the following characteristics have been observed - individual pigs' body weights were recorded every second week; feed intake and feed conversion ratio were determined every second week per group; total serum cholesterol level at the end of the experiment – by the method of Mrskos and Tovarek as described by Ibrishimov and Lalov.

On the basis of these data was calculated average daily gain and feed conversion rate every two weeks.

The research data analysis was made by the usual variation statistics methods and Student's t-test was used to compare means.

The data characterizing pigs' body weight shown, that pigs from the experiment group had higher body weight for the whole experimental period. This rise in body weight was by 7,3; 4,6 and 4,5 % at the end of the 2nd week, of the 4th week and at the end of the experiment, respectively, the improvement was however statistically insignificant.

Average daily gain was similar among treatment. However pigs fed DDGS had insignificant higher average daily gain by 23,6; 0,6, and 4,5 % at the end of the 2nd week, of the 4th week and at the end of the experiment, respectively. Average daily gain for all experimental period was higher for the experimental group then the control by 7,6 %. These results are in agreement with other research studies with pigs fed DDGS.

Feed consumption was similar among treatments. Feed conversion ratio was improved for the experimental group for all experimental period by 9,6 % ($P < 0,05$). These data are in contrast with the results of Whitney and Shurson and Burkey et al.

Total serum cholesterol was increase in group fed DDGS by 29,3 % ($P < 0,05$). These results are in agreement with other studies.

The results of this study have shown that the inclusion of wheat DDGS in diet improved average daily gain by 7,6 % and feed conversion rate by 9,6 %, but increased serum cholesterol by 29,3 % in weaned pigs.

20 % сухих продуктів перегонки на біоетанол пшениці з розчинниками. Дослідження були проведені на 26 відлучених поросятах породи Юна (початкова жива маса $13,8 \pm 0,06$ кг) протягом 6 тижнів. Жива маса обліковувалась кожних 2 тижня.

Результати досліджень показали, що додавання до раціону сухих продуктів перегонки пшениці на біоетанол збільшує середньодобові прирости на 7,6 %. Рівень конверсії корму також збільшився на 9,6 %.

В експериментальній групі збільшився загальний холестерин сироватки на 29,3 %.