

Effect of Roxazim G2 introduction into the compound feed for growing and fattening pigs

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SUMMARY

The positive effect of the fermentative preparation Roxazim G2 introduction into compound feed for growing and fattening pigs at the rate is of 100g/ton. Introduction of different rates of enzymatic agent Roxazim G2 into compound feed for pigs stimulated slaughter yield and «muscle eye» area increase and consequently had positive effect on meat characteristics of growing and fattening pigs.

Keywords: growing pigs, fermentative preparation, Roxazim G2, compound feed

INTRODUCTION

The high progress in hog farming is based on the creation of firm forage resources subject to natural, climatic and economic conditions. Barley is one of the main crops grown in the South region of Russia to provide farm animals with fodder grain. It is one of main components of the compound feed for pigs. But along with positive factors there are a lot of starch free hard-digestible polysaccharides, xylans, β -glycans, and enzyme inhibitor of α amylase-abscisic acid - it is found in endosperm. All these substances decrease digestibility of fodder nutrients and the efficiency of their absorption in the gastrointestinal tract. To increase the nutrients digestibility preliminary processing is recommended including the use of enzymatic agents (Ezdacov, 1978, Kevin, 2008; Kononenko, 2009).

Enzymes are present in all live cells where they have important function in the running of metabolic processes, during which nutrients turn into energy and structural material for the construction of new cells (Ezdaco, 1978; Petrukhin, 1989; Okolekova, 2001). Unlike food proteins enzymes as catalysts are able to split proteins. It means that their presence accelerates processes. After the reaction is completed, enzymes are free to start another reaction.

One of the methods of digestibility and availability increase of plant nutrients is the addition of enzymatic agents which improve the degradation of protein, lipids, fiber and other hardly available carbohydrates in gastrointestinal tract. It is also known that the fiber of plant feed is often a source of irritation

and traumatism for mucous membrane in gastrointestinal tract of pigs (Plesovskiy, 1999; Faritov, 2002; Osepchuk, 2008; Cikov, 2008).

MATERIAL AND METHODS

The objective of this investigation was to study the effect of the introduction of different doses of enzymatic agent Roxazim G2 into the compound feed for growing and fattening pigs and their effect on the productivity, output quality, digestible and intermediary metabolism and profitability of pork production.

The scientific and economic experiment was held on a market pig farm of Close Corporation of Seed-growing Agrarian Company "Rus" in Timashevsky region of Krasnodar Territory. Enzymatic agent Roxazim G2 - multienzymatic composition with high concentration of enzymes in 1g: cellulose activity - 8000 U, β -glucanase activity - 18000 U, xylanase activity 26000 U were used in the trials and showed positive effect on the main types of wheat and barley diets with sunflower and soybean oil cake. Owing to universality of the enzyme Roxazim G2 for the majority of the rations it becomes interesting for practice.

Groups under trial were formed as similar pairs where breeds, origin, age and live weight were taken into consideration. Four groups were formed (one control and three experimental groups). To the main diet for the control group the enzymatic agent Roxazim G2 was added: for the second group - 80 g/ton of compound feed; for the third group - 100g/ton and for the fourth - 120 g/ton.

RESULTS AND DISCUSSION

Live weight, absolute and average daily weight gains were determined during periods of the animals' life as a result of the investigation (table 1).

As appears from the data shown in table 1, the highest live weight gain of the animals at the end of the experiment was in the fourth experimental group, the excess as compared with the control is 7.9kg or 7.8% with high degree of reliability in differences of the results ($P < 0.05$). During the experiment the animals in the fourth group were in leading position in live weight among other experimental groups. Consequently, the fourth experimental group showed higher results in average live weight gain as compared with other groups. Thus, during the first experimental period, aged 60 - 120 days, the fourth group exceeded the control one by 34g or 7.3%. The period from 121 to 200 days showed the gap in average daily weight gain by 74g or 10.9% for the benefit of the fourth experimental group.

It should be noticed that the showing for the third experimental group differed insignificantly from that of the fourth group. Thus, average live weight per head in the third group was 108.9kg, which is 7.8kg or 7.7% higher than in the control. During the whole period of the experiment average daily weight gain in the third group was 56g or 9.5% higher than in the control. As in the

fourth experimental group the excess was with high degree of reliability in differences of the results ($P < 0.05$).

Table 1 Live weight and average daily weight gain of the animals under trial

	Groups			
	C 1	E 2	E 3	E 4
Live weight at the age, days				
60	18.80±0.26	18.84±0.22	18.70±0.27	18.76±0.24
120	46.64±0.55	48.25±0.58	48.53±0.44	48.62±0.49
200	101.10±1.7	105.90±1.9	108.90±1.9	109.00±2.0
Gross weight gain, kg				
60 - 120	27.84	29.41	29.83	29.86
121 - 200	54.46	57.65	60.37	60.38
60 - 200	82.30	87.06	90.20	90.24
Average daily live weight gain for the period, g				
60 - 120	464±9.9	490±7.3	497±4.0	498±5.0
121 - 200	681±25.2	721±24.8	755±24.5	755±25.9
60 - 200	588±14.3	622±13.4	644±13.8	645±14.8
% to the control	-	105.8	109.5	109.7

The figures on the second experimental group had intermediate position between the third and the control ones.

Food efficiency rate was estimated on the basis of the previous data divisions on animal food intake and their growth efficiency as affected by different rates of introduction of enzymatic agent Roxazim G2 into the diets of young pigs. In the third and fourth groups under trial feed conversion rate was 3.8 FU (feed units) per 1kg of weight gain, which is 0.4 FU or 9.5% lower than in the control one. The figures on the second trial group had intermediate position between the results of the control and the third and fourth experimental groups. Feed conversion efficiency was 0.3 FU or 7.1% per 1kg of weight gain lower than in the control.

Consequently, to make feed conversion efficiency for growing and fattening pigs lower it is recommended to feed them with enzymatic agent Roxazim G2 at the rate of 100-120 g/ton of compound feed.

Table 2 Feed conversion factor for experimental animals, %

	Groups			
	C 1	E 2	E 3	E 4
Dry matter	75.80±0.54	78.20±0.43	79.00±0.49	78.90±0.51
Crude protein	74.60±0.52	76.80±0.61	77.50±0.50	77.60±0.55
Fat	54.30±0.71	54.10±0.66	54.40±0.56	54.30±0.64
Fiber	30.30±0.62	34.20±0.57	34.80±0.47	34.90±0.65
NFE	85.20±0.63	86.80±0.73	86.90±0.48	86.80±0.49

At the age of 4.5 months young pigs were subjected to the digestion trial. According to the results of full analysis of feedstuffs composing the diet, their residues and excrements, we estimated the food conversion factor, which is shown in table 2.

The addition of different rates of the enzymatic agent Roxazim G2 to the diets of all experimental groups resulted in the increase of the dry matter and protein digestibility factor with high degree of reliability in differences. As to the fat digestibility factor, it should be noticed that the addition of enzymatic agent into compound feed for the second and third experimental groups did not show negative effect on fat digestibility.

It also should be noticed that the addition of different rates of enzymatic agent affected fiber digestibility positively. In all experimental groups fiber digestibility factors were considerably higher than in the control group by 3.9 – 4.6%, respectively. Between the third and the fourth experimental groups there was no real difference. Consequently, the sufficient rate of enzymatic agent Roxazim G2 is 100g per ton of compound feed. Extra addition of the enzymatic agent, at the rate of 120 g/ton does not improve the digestibility of nutrients in the diet.

After the scientific and economic experiment was finished there was a control slaughter. Five animals with average live weight, similar to average showing in the group, were taken from each group (table 3).

Table 3 Results of the control slaughter

	Groups			
	C 1	E 2	E 3	E 4
Preslaughter weight, kg	100.6	105.0	108.9	108.8
Slaughter weight, kg	62.0	67.4	70.5	70.2
Slaughter yield, %	61.6	64.2	64.7	64.5
Carcass length, cm	87.6	91.4	92.5	92.3
Depth of fat over 6-7 pectoral vertebra, mm	36.0	34.0	33.6	33.8
Area of «muscular eye», cm ²	31.6	34.3	34.4	34.2
Weight of back third of half carcass, kg	9.5	10.1	11.2	10.9

Information obtained as a result of control slaughter of pigs showed some regularity in the affect of enzymatic agent Rixazim G2 on meat and fat slaughter qualities irrespectively of the enzyme introduction rate into compound feed. In all experimental groups slaughter output was 2.6 – 3.1% higher than in the control group. Slaughter weight was higher in experimental groups, corresponding to higher preslaughter live weight, reflecting average showing in the groups at the end of the experimental period.

In experimental groups the area of «muscle eye» tends to be more than in a control one. This indicates positive effect of enzymatic agent Roxazim G2 use in the composition of compound feed for pigs. So the area of «muscle eye» in

the third group was 2,8 cm² more than in the control group. The same regularity is in the second and fourth experimental groups as compared to the control one.

Weight of the back third of the half carcass was higher in experimental groups as compared to control, but this, first of all, was connected to the higher showing of preslaughter live weight.

Thus, introduction of different rates of enzymatic agent Roxazim G2 into compound feed for pigs stimulated slaughter yield and «muscle eye» area increase and consequently had positive effect on meat characteristics of growing and fattening pigs. And the improvement of meat characteristic is nowadays one of the main goals in pig farming as meaty pig has higher price and finds a ready market among meat processing enterprises.

One of the principal indicators of enzymatic agents use in pig farming is profitability rate. Use of enzymatic agent Roxazim G2 in experimental groups resulted in profit increase from growing and fattening pigs and profitability increase, which was the highest 37.4% in the third group, which is 12.4% higher than in the control group.

CONCLUSIONS

The use of the enzymatic agent Roxazim G2 produced positive results. The best rate of introduction of enzymatic agent Roxazim G2 into compound feed for growing and fattening pigs is 100g/ton.

The rate of 80 g/ton is not sufficient yet, as the potential of animals cannot be used completely, and the rate of 120 g/ton does not favor the cost price of 1 kg of weight gain, the increase of profitability rate in pig farming in the conditions of forage resources of a farm with barley diets.

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