

THE EFFECT OF NAKED OATS (*AVENA NUDA*) AND RAPESEED MEAL ON GROWTH PERFORMANCE OF YOUNG PIGS

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Summary, keywords

In a 28-day experiment conducted on 32 young growing pigs of Polish Landrace x Duroc (18-45 kg body weight) the nutritional value of four diets containing: 0; 23,7; 47,4 and 71,0% of naked oats cv. Akt and 0; 8,0; 16,0 and 24,0% of rapeseed meal, respectively, was evaluated. The results of the experiment suggest that experimental diets can be useful in practical nutrition of young pigs.

pigs, nutrition, naked oats, rapeseed meal

Introduction - Úvod

The naked oats grown in Poland contain 14,4 – 15,7% crude protein, 1,8-2,3% crude fibre and 7,6 – 8,0% ether extract in dry matter (Maślanek et al., 2001). Earlier studies showed that naked oat could be a good alternative to maize in diets for weaned and growing-finishing pigs (Friend et al., 1988; Brand and van der Merwe, 1996). In Poland *Akt* is the first cultivar of naked oats (registered in 1997), and the area of its cultivation is expanding.

Winter type, dark-seed, low-erucic acid (2%) and low glucosinolate (7,5-13,0 M/g seed) rapeseed grown in Poland is processed mainly in oil factories yielding solvent meal and in expelling units producing press cake. Rapeseed meal production amounts to about 500 000 t/year. Due to lower protein content (about 37%) and high crude fibre content, energy value of rapeseed meal for poultry and young pigs is lower than that of canola (Pastuszewska et al., 2001).

Up to now usefulness of diets containing naked oats and rapeseed meal in pig nutrition was not studied. Therefore the objective of this study was to evaluate the performance of young growing pigs fed diets containing different levels of naked oats and rapeseed meal.

Methods - Metody

The experiment was performed using 32 young pigs, 16 gilts and 16 barrows, of about 18,0 kg initial body weight, aged 8 weeks, crosses of Polish Landrace sows and Duroc boars. The pigs were divided into four experimental groups by the analogue method based on the litter, sex and the initial body weight.

The component composition and nutritive value of diets for experimental pigs are included in table 1. The diets were balanced according to the *Nutrient Requirements of Pigs* (1993). The diets were supplemented with synthetic lysine and methionine. The control diet was based on soybean meal and ground barley. The experimental diets contained 23,7; 47,4 and 71,0% of naked oats of Polish cv. *Akt*, and 8,0; 16,0 and 24,0% of rapeseed meal, respectively.

The experiment lasted for 28 days. Daily feed intake, daily gains and feed conversion ratio were determined.

The obtained results were statistically analyzed by common methods in animal sciences with the use of STATISTICA for Windows.

Results and Discussion

The experimental diets had similar energy values and the crude protein, determined by laboratory analysis, did not differ markedly from the value assumed in the methodology (tab.1).

The average daily gains in body weight of the experimental pigs were 946, 918, 920 and 923g in groups 1-4, respectively (tab.2). The highest average daily gains were obtained for pigs from group 1 fed barley-soybean meal diet. However, the differences between groups were statistically insignificant. The results of growth rate of experimental pigs were satisfactory and were very similar to those obtained in the previous experiments carried out in the same piggery (Bugnacka and Falkowski, 2001; Maślanek et al., 2001).

There were no significant differences in the daily feed intake between the diets (tab.3). In the experiments on younger pigs, the intake of diets containing 71,5 or 73,8% of naked oat decreased significantly (Brand and van der Merwe, 1996; Falkowski et al., 2000). The pigs that received the barley – soybean meal control diet were better at feed/gain ratio compared with the pigs of groups 2-4. However during the whole experimental period (1-28 days) differences between feeding groups were not significant (tab.3). The average results of feed conversion ratio were similar to those observed in our earlier studies (Bugnacka and Falkowski, 2001; Maślanek et al., 2001).

The results of described growth performance experiment suggest that experimental diets can be useful in practical nutrition of young pigs.

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Table 1: Component and chemical composition (%) and nutritive value of diets for young pigs

Indices	Diets			
	1	2	3	4
Ground naked oats	-	23.70	47.40	71.00
Rapeseed meal	-	8.00	16.00	24.00
Soybean meal	23.00	15.00	7.00	-
Ground barley	69.50	46.80	23.90	-
Soybean oil	2.50	1.50	0.70	-
PP – grower premix *	1.50	1.50	1.50	1.50
Dicalcium phosphate	1.80	1.80	1.80	1.80
Limestone	1.00	1.00	1.00	1.00
Salt (NaCl)	0.30	0.30	0.30	0.30
DL – methionine	0.10	0.10	0.10	0.10
L - lysine	0.30	0.30	0.30	0.30
Dry matter	86,04	86,95	87,08	87,57
Crude protein	19,31	19,32	19,26	19,06
Crude fat	4,18	4,45	5,14	5,86
Crude fibre	3,18	3,74	3,93	4,11
Crude ash	5,65	5,71	5,99	6,52
N – free extractives	53,72	53,73	52,76	52,02
Organic matter	80,39	81,24	81,09	81,05
Gross energy [MJ/kg]	16,58	16,78	16,51	16,70
Digestible energy [MJ/kg]	13,81	13,66	13,39	13,56
Metabolisable energy [MJ/kg]	13,05	12,94	13,05	13,15

* PP – grower premix contains per 1 kg: vit. A. 500 000 IU; vit.D₃. 100 000 IU; vit. E. 1 000 mg; vit. K₃. 100 mg; vit. B₂. 150 mg; vit. B₁₂. 1 500 µg; Mn. 1 000 mg; Co. 5000 µg; Zn' 1500 mg; Cu. 250 mg; Fe. 2 500 mg; J. 40 mg; carrier up to 1000g

Tab. 2: Body weight and average daily gains of pigs

Specification	Period of experiment days	Diets			
		1	2	3	4
Average body weight [kg]	1	18.5 ±2.79	18.4 ±1.23	18.9 ±1.29	18.9 ±0.54
	14	31.7 ±3.67	31.9 ±2.20	32.8 ±1.68	32.6 ±1.33
	28	45.0 ±3.98	44.1 ±1.83	44.7 ±3.15	44.7 ±2.11
	1 – 14	941 ±72.6	963 ±84.8	991 ±80.7	978 ±64.3
Average daily gain [g]	15 – 28	950 ±73.9	874 ±133.6	850 ±136.9	868 ±74.9
	1 - 28	946 ±55.4	918 ±66.5	920 ±88.5	923 ±59.6

Table 3: Average feed intake and feed/gain ratio

Specification	Period of experiment days	Diets			
		1	2	3	4
Average daily feed intake [kg]	1 – 14	1.42 ±0.316	1.49 ±0.315	1.50 ±0.314	.52 ±0.316
	15 – 28	2.02 ±0.159	1.95 ±0.311	1.92 ±0.306	1.97 ±0.165
	1 - 28	1.72 ±0.219	1.71 ±0.264	1.71 ±0.262	1.75 ±0.209
Feed/gain ratio [kg/kg]	1 – 14	1.51 ±0.324	1.55 ±0.326	1.52 ±0.324	1.56 ±0.322
	14 – 28	2.12 a ±0.206	2.23 b ±0.221	2.26 b ±0.570	2.27 b ±0.219
	1 - 28	1.82 ±0.233	1.86 ±0.227	1.89 ±0.377	1.92 ±0.220

^{a,b} - P ≤ 0.05