THE PERFORMANCE OF BROILER CHICKS FED DOUBLE-LO.. RAPESEED OILMEAL

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Introduction

The rapeseed crop in many European countries is one with great potential as a protein source for poultry feeding. Oilmeals from the new low-glucosinolate cultivars have been used up to 15% or even 20% in experimental diets and growth of the broiler chicks has been the same or slightly inferior as compared to soyabean oilmeal control groups /Thomke et al., 1983; Kiskinen, 1983; Gawęcki et al., 1983; Fritz et al., 1984/.

Researches in the improvement of rapeseed varieties and optimalisation of technological treatments during oil extraction are still going on and further feeding investigation are still necessary.

The objective of this paper was to asses whether higher levels of low-glucosinolate oilmeals from rapeseed variety START OO and new variety JANTAR OO may affect the performance of broiler chicks.

Experimental

Two runs of researches were conducted. In the first one, three experiments were done altogether on 600 sexed broilers. Forty chicks per group were divided equally into four replications of 10 one day-old. Control chicks were fed wheat-soya basal diet. In experimental diets the oilmeal from rapeseed of low-glucosinolate /LG-RSM START OO/ or for comparison from rapeseed of high-glucosinolate /HG-RSM/ content were substituted isonitrogenously for soyabean oilmeal. Diets with RSM were /or not/ supplemented with fat. Oilmeals HG-RSM contained 1.9mg ITC and

3.3mg VOT and START 00 LG-RSM 0.6mg and 0.7mg per 1 g, respectively.

In the second run /experiment 4/ LG-RSM from a new variety of JANTAR 00 processed with a corrected technology was taken.

Oilmeal was used as a partial substitute for soyabean oilmeal and included into wheat-soya diet at the level of 5, 7.5, 10, 12.5, 15, 17.5 or 20% JANTAR 00 LG-RSM contained only 0.12mg ITC and 0.16mg of VOT per 1 g of fat-free matter. One-day old chicks were divided into 8 groups with 5 replications of 10 chicks each.

Results and discussion

In the first series of researches /Koreleski et al., 1986/ growth of chicks fed HG-RSM was depressed by 42% and feed conversion by 13% as compared to control group fed soyabean meal.

Significantly better results were obtained with START 00 LG-RSM. The performance of broilers was in average only by 6% lower than in control. The effect of high dietary level of LG-RSM and for comparison of HG-RSM on vitamin content in liver and serum, calcium content in femur and weight of liver and thyroid glands was also investigated.

Results given in Table 1 do show that not only HG-RSM but also high level of START 00 LG-RSM caused liver and thyroid glands hypertrophy and decreased the content of vitamin A and B_2 in liver and serum and calcium level in femur. When chicks were fed LG-RSM only in the second period of feeding /29-56 days/ the decrease of vitamin and calcium content was less marked.

In the second series of researches /experiment 4/ the new variety JANTAR 00 rapeseed oilmeal of extremely low level of glucosinolates was used as a component of diets /Table 2/.

Metabolizable energy content of JANTAR 00 RSM is not yet estimated but probably it could not have been higher than 9.43 MJ per kg of dry matter -the average ME value estimated for START 00 RSM /Gawęcki et al., 1983a,

Hanczakowski and Fraś, 1983/. As it was calculated the highest 20% level of JANTAR LG-RSM decreased dietary metabolizable energy about 0.5 MJ and the increase of crude fibre content up to 5.3% was analysed in the diet.

Results of the experiment are presented in Table 3. Increased levels of LG-RSM JANTAR progressively enlarged thyroid glands weight and that effect was statisticaly significant only when 20% level of RSM was used in the diet. The extent of hypertrophy was similar as compared to enlargement observed in chicks fed START OO RSM despite JANTAR RSM contained lower level of glucosinolates.

Weight gain data in chicks were not significantly influenced by the used levels of rapeseed JANTAR OO meal. At 20% level in the diet rapeseed meal impaired the feed conversion with about 0.11kg per kg of weight gain.

Results of the 4th experiment suggest that in broiler feeding oilmeal from low-glucosinolate JANTAR OO rapeseed can be included up to 17.5% to the wheat-soya diet -without dietary energy supplementation.

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Table 1. Effect of LG-RSM START 00 or HG-RSM on weight of selected organs and the content of vitamins and calcium in chicks' tissue /Koreleski et al., 1986/.

Group	Kind of diet	Dietary level of RSM starter/ finisher	Weight		Vitamin content				Calcium content in femur
			of liver in % of carcass weight	of thyroid glands	in fresh liver		in serum		
					A	B_2	A	B_2	
		%		mg	i.u/g	mcg/g	i.u/g	mcg/g	%
I	wheat-soybean meal	-	1,82	165	1173A	40.4A	185a	23.0a	14.7a
II	wheat-rapeseed meal /LG/	33/26	2.26	225	757B	28.2AB	136b	21.4a	13.7ab
III	wheat-rapeseed meal /LG/	0/26	2.12	240	1004AB	28.2B	152ab	24.1a	14.0ab
IV	wheat-rapeseed meal /HG/	0/26	2.47	275	821B	21.3B	140b	22.5a	12.9b

Means denoted with the same small or capital letters are significantly different at, respectively, P = 0.05 or P = 0.01

Table 2. Composition of diets in % /experiment 4/.

Component	basal diet		experimental diets	
	period of feeding /in days/			
	1-21	22-56	1-21	22-56
ground wheat	65.4	73.8	64.4-60.4	72.8-68.8
fish meal	3.0	3.0	3.0	3.0
meat-bone meal	-	1.0	-	1.0
fodder yeast	3.0	2.0	3.0	2.0
grass meal	2.0	2.0	2.0	2.0
soyabean oilmeal	23.0	15.0	19.0-8.0	11.0-0
rapeseed oilmeal /JANTAR OO/	-	-	5.0-20.0	5.0-20.0
NaCl	0.3	0.3	0.3	0.3
limestone	0.5	0.8	0.5	0.8
phosphate Bonarka /improved/	1.8	1.1	1.8	1.1
vitamin-mineral-antibiotic premix with methionine	1.0	1.0	1.0	1.0
Composition:				
crude protein /%/	22.01	19.63	22.07-21.65	19.46-19.03
methionine /%/	0.45	0.37	0.44-0.45	0.36-0.37
lysine /%/	1.07	0.90	1.05-1.07	0.88-0.89
metabolizable energy MJ/kg	11.69	11.94	11.53-11.06	11.78-11.3
Ca /%/	1.0	1.0	1.0	1.0
P-available	0.6	0.5	0.6	0.5
crude fibre	3.65	3.49	4.07-5.34	3.91-5.19

Table 3. Performance of chicks fed different levels of LG-RSM JANTAR 00 in wheat-soya diets /experiment 4/.

Group	Dietary level of RSM	Weight of thyroid glands	Weight gain		Feed conversion	
	%	mg	g		kg	
			1-21 days	1-56 days	1-21 days	1-56 days
I	-	166ab	386 a	1904 a	1.84 ab	2.46 ab
II	5	152 a	408 a	1837 a	1.75 a	2.44 ab
III	7.5	156 a	377 a	1795 a	1.86 ab	2.47 ab
IV	10	154 a	387 a	1818 a	1.83 ab	2.39 a
V	12.5	163 ab	393 a	1817 a	1.87 ab	2.48 ab
VI	15	170 ab	377 a	1837 a	1.89 ab	2.48 ab
VII	17.5	182 ab	405 a	1822 a	1.87 ab	2.44 ab
VIII	20	213 b	384 a	1813 a	1.92 b	2.56 b