# STUDIES ON THE DETERMINATION OF THE OPTIMAL SHARE OF RAPESEED MEAL IN THE NUTRITION OF BROILERS

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Taking up these studies was motivated by the considerable expansion of rape cultivation in our country and its frequent application in the nutrition of animals. Numerous experiments carried out at home and abroad showed however that applying rapeseed meal in mixed feeds for poultry was less reasonable because in comparision with mixed feeds having soybean meal in their composition which does not contain any glycosides, it could show an inhibition of growth and a decrease of feed efficiency as well as in a greater mortality and the like.

It is more promissing to apply low-glycosides varieties of rapeseed in the nutrition of poultry. To this group belongs the variety of Start "00" tested in this study along with the variety of Skrzeszowicki /a bitter one/ and soybean meal.

The purpose of this work was to estimate the nutritive value of the rapeseed meals obtained from two varieties of rape /the older Skrzeszowicki and the newer Start "00" and the level of tolerance of this feedstuff in which can use in broiler's ration.

## Materials and methods

One-day 600 broilers /Euribrid/ devided into 6 feeding groups were used in the tests. The birds were kept for 8 weeks in batteries accordin to the generally applied rules of the cage chicken rearing. In the ad libitum nutrition standard mixed feeds DKA starter /0-3 weeks of age/ and DKA finisher /4-8 weeks of age/ were used on the under-

standing that in the experimental groups /II - VI/ rapeseed meal was introduced, from 6 per cent in groups II and III up to 15 per cent in group VI. The proportional share of the rape varieties tested /Skrzeszowicki and Start "00"/ in the mixed feeds as well as their nutritive value /according to ones own analysis/ are give in table 1.

In the course of the studies the feed consumption in groups, individual live weight at 3 and 8 weeks of age and wholesomenessof birds /currently/ were checked.

After finishing fattening 10 birds from each group /5 males and 5 females/ were randomly chosen whereupon after their slaughter a judgement of the carcasses was performed as well as the weight of livers and thyroids was determined. Skeletonized breast muscles were put to a chemical and physico-chemical evaluation according to the generally used methods.

## Results and Discussion

Chemical analysis of rapeseed meals showed the content of Isothiocyanates of 1.90 and 0.53 mg/g/d.m in the rapeseed meal of Skrzeszowicki variety and of Start "00" variety respectively. The content of Oxazolidinethione amounted 1.50 and 0.53 mg/g/d.m. respectively.

During the broiler rearing neither mortality was recorded nor symptoms of disease were obserwed. The live weight of 3 weeks-old broilers /table 2/ was distinctly lower in group II /457 g/ nourished feed with 6 per cent share of rapeseed meal of the old Skrzeszowicki variety. After 8 weeks of fattening broiler's weighted about 2 kg, no influence of the nutrition at that age on the live weight gain being stated. Feed consumption per 1 kg of live weight gain was from 2.20 kg in group III up to 2.29 kg in group VI, which was fed with the 15 per cent share of rapeseed meal of the Start "00" variety. Crude protein consumption for a weight gain unit was greater in the control group broilers /from 7 up to 17 g/ than in broilers fed feed with rapeseed meal share. In the feed consumption a certain upward trend proportional to the colza meal share of the Start "00" variety in the mixed feed could be observed.

Except for birds fed meal from the Skrzeszowicki rapeseed /group II/, the carcasse dressing percentage of broilers was even in the groups /67 per cent/ and the carcasse weight depended on the live weight /table 2/. As regards dressing percentage of breast muscles and that of leg and shank muscles, no distinct differency depending on the nutrition of broilers were recorded.

Weight of livers in terms of 1 kg of body weight demonstrated a slight growth trend in broilers fed feed with rapeseed meal share, i.e. by 2.63 g when feeding meal from the Skrzeszowicki rapeseed and above 1 g in broilers fed from Start "00" rape /except for group IV/. These differencies, however, appeared to be statistically insignificant.

Weight of thyroids in terms of 1 kg of body weight increased in broilers fed feed with rapeseed meal share /by 6.95 mg in the control group and from 8.43 up to 11.94 mg in the experimental groups/. The smallest increase of thyroids /by 0.499 mg/ was found when feeding rapeseed meal /6 per cent/ from the old Skrzeszowicki variety.

As far as the chemical composition of meat as well as its physico-chemical and organoleptical characteristics are concerned, no differencies depending on the experimental nutritional effect were noticed.

Results of the present studies suggest the possibility to replace in the standard mixed feeds /DKA starter and DKA finisher/ for broilers 15 per cent of soybean meal by rapeseed meal from Start "00" variety. The changes in the weight of thyroids in the experimental broiler groups demonstrate however the presence of thioglycosdes in the rapeseed meal from the Start "00" variety.

**Abstract**

In the nutrition of broilers soybean meal in mixed /DKA starter and finisher/ was replaced by rapeseed meal from the old Skrzeszowicki rape variety /6%/ and Start "00" variety in a quantity of 6, 9, 12 and 15 per cent - tab. 1.

After 8 weeks of fattening, irrespective of the system of feeding body weights were equalized /about 2 kg/ just as feed efficiency. In the carcase dressing percentage and

in slaughter quality no differencies depending on the system of broiler feeding were found - table 2.

The weight of livers in terms of 1 kg of body demonstrated only a certain growth trend when feeding rapeseed meals. However a distinct increase of thyroids was stated when feeding the broilers with rapeseed meals. The smallest increase of thyroids, as compared with the control group, was recorded when feeding broilers with 6 per cent rapeseed meal share from the Start "00" variety /by 1.48 mg/100g of body weight/ - table 2. Production results and the state of health of broilers suggest a possibility to replace up to 15 per cent the soybean meal in the standardized mixed feeds by rapeseed meal from the Start "00" colza variety.

Table 1. Nutritive value of mixed feeds with various share of rapeseed meals introduced instead of soybean meal

| Specification | Feeding period /weeks/ | Group rapeseed meal share in the feed rapeseed variety | | | | | |
|---|---|---|---|---|---|---|---|
| | | I | II | III | IV | V | VI |
| | | control[x] | Skrzeszowicki 6% | Start"00" 6% | Start"00" 9% | Start"00" 12% | Start"00" 15% |
| Dry matter, % | 0 - 3 | 87,41 | 87,39 | 87,62 | 87,88 | 87,33 | 87,23 |
| | 4 - 8 | 87,75 | 87,76 | 87,74 | 87,68 | 87,21 | 87,29 |
| Crude protein,% | 0 - 3 | 22,25 | 22,00 | 22,35 | 21,67 | 21,34 | 21,41 |
| | 4 - 8 | 20,60 | 19,74 | 20,32 | 20,02 | 20,05 | 19,51 |
| Crude ash,% | 0 - 3 | 5,47 | 5,66 | 5,78 | 5,84 | 5,69 | 5,65 |
| | 4 - 8 | 5,70 | 5,43 | 5,14 | 5,54 | 5,34 | 5,64 |
| Crude fiber,% | 0 - 3 | 1,86 | 2,00 | 1,83 | 2,18 | 2,08 | 1,99 |
| | 4 - 8 | 2,02 | 2,14 | 2,02 | 2,14 | 2,11 | 2,16 |
| Ether extract,% | 0 - 3 | 3,42 | 3,17 | 3,41 | 3,50 | 3,27 | 3,09 |
| | 4 - 8 | 2,59 | 3,27 | 3,39 | 3,12 | 3,07 | 3,00 |
| M.E., MJ/kg diet | 0 - 3 | 12,33 | 12,25 | 12,28 | 12,25 | 12,23 | 12,20 |
| | 4 - 8 | 12,40 | 13,32 | 12,34 | 12,32 | 12,29 | 12,26 |
| Nitrogen utilization in relation to intaken,% | 0 - 3 | 55,30 | 53,20 | 55,85 | 49,95 | 54,70 | 52,30 |
| | 4 - 8 | 55,30 | 53,60 | 57,10 | 53,30 | 49,85 | 55,15 |

x - Rapeseed meal share in the control feed - Starter 0 - 3 week - 27,0% Soybean meal
Finisher 4 - 8 week - 20,5% Soybean meal

Table 2. Some results of the broiler fattening and the weights of livers and thyroids

| Specification | | Groups I | II | III | IV | V | VI |
|---|---|---|---|---|---|---|---|
| Body weights, g - 3-th week | $\bar{x}$ | $511^{Aa}$ | $457^{B}$ | $506^{A}$ | $500^{A}$ | $486^{Ab}$ | $505^{A}$ |
| | CV% | 9,9 | 15,6 | 11,5 | 10,9 | 10,0 | 10,0 |
| - 8-th week | $\bar{x}$ | 2027 | 1992 | 2096 | 2021 | 1962 | 1960 |
| | CV% | 14,8 | 14,7 | 16,3 | 15,7 | 12,6 | 16,3 |
| Consumption per 1 kg of body weight gain: of mixed feed, kg | $\bar{x}$ | 2,24 | 2,23 | 2,20 | 2,24 | 2,25 | 2,29 |
| of crude protein, g | $\bar{x}$ | 475 | 458 | 468 | 462 | 461 | 463 |
| Carcasse dressing: -carcase eviscerated, g | $\bar{x}$ | $1368^{AB}$ | $1328^{B}$ | $1489^{A}$ | $1356^{B}$ | $1324^{B}$ | $1317^{B}$ |
| | CV% | 7,0 | 9,6 | 14,2 | 6,5 | 8,4 | 6,2 |
| | % | 67,5 | 66,7 | 67,7 | 67,1 | 67,5 | 67,2 |
| -breast muscles, g | $\bar{x}$ | 123 | 121 | 129 | 121 | 117 | 122 |
| | CV% | 11,2 | 8,4 | 15,1 | 13,6 | 9,8 | 10,4 |
| -leg muscles, g | $\bar{x}$ | 98 | 95 | 103 | 98 | 95 | 91 |
| | CV% | 7,7 | 12,2 | 12,8 | 10,9 | 9,6 | 10,7 |
| -shank muscles, g | $\bar{x}$ | 70 | 69 | 74 | 69 | 67 | 66 |
| | CV% | 7,8 | 15,7 | 15,9 | 14,2 | 19,1 | 12,6 |
| Weight of liver g/kg of body weight | $\bar{x}$ | 20,25 | 22,88 | 21,24 | 21,59 | 21,64 | 20,28 |
| | CV% | 14,8 | 9,9 | 11,1 | 9,3 | 9,3 | 5,9 |
| Weight of thyroid mg/100 g of body weight | $\bar{x}$ | $6,95^{Bb}$ | $11,94^{A}$ | $8,43^{a}$ | $10,68^{A}$ | $10,15^{A}$ | $10,55^{A}$ |
| | CV% | 34,1 | 25,5 | 33,0 | 25,4 | 21,3 | 31,3 |

A,B - $P \leq 0,01$; a,b - $P \leq 0,05$