# THE INFLUENCE OF FEEDING 00-RAPESEED TO BROILERS ON FEED INTAKE, GROWTH PERFORMANCE AND FATTY ACID COMPOSITION OF CARCASS FAT

W. KRACHT; H. JEROCH; W. MATZKE

Institute of Animal Nutrition, Martin-Luther-University of Halle-Wittenberg, Emil-Abderhalden-Str. 25b, 06108 Halle/Saale, FR Germany

M. RISTIC

German Department of Meat Research, Baumann Str.20, D- 95326 Kulmbach, FR Germany

ABSTRACT

One experiment was conducted to assess the use of different 00-rapeseed levels (0-25 %) in broiler diets and their influence on feed consumption , growth performance and fatty acid composition of subcutaneous fat. A level of 15 % rapeseed was tolerated without growth depression. The content of polyunsaturated fatty acids increased with rising rapeseed levels.

## INTRODUCTION

Among the agricultural plants, which are cultivated in the centre of Europe, rapeseed is marked out by the high fat content of its seed. In the last decades the antinutritive substances of rapeseed, especially the glucosinolates, are diminished by plant breeding. Thereby it becomes possible to include rapeseed into feed mixtures for animal with high energy requirements for instances in broiler feed.

There are a number of reports on feeding value of full fat 00-rapeseed for broilers (Olomu et. al. 1974, 1975, Leeson et. al. 1978, 1987, Shen et. al. 1991) . Most of these Canadian reports recommended levels, varying between 10 and 20 % full fat 00-rapeseed in broiler diets. Jahreis et. al. 1993 found growth depressions at the lowest inclusion level (5 %).

## EXPERIMENTAL

### Material and Methods

In one trial with sex-selected male Hybrid-broiler chicks, 0; 10; 15; 20 and 25 % 00-rapeseed were included in isocaloric and isonitrogenous diets. The feed mixtures with 15, 20, 25 % rapeseed were fed continuously (1.- 37. day) and during a limited period (1.-21. day). Behind this period the mixture without rapeseed was given. The highest level (25 % rapeseed ) was additional employed only between the 22. and 37. day. The composition of the experimental diets is shown in Table 1.The rapeseed was ground with a roller mill.It contained 14 µmol glucosinolates per g at 91% dry matter. Each diet was fed to 10 cages with three animals per cage. Feed and water were provided *ad libitum*. Records were kept of feed consumption and body weight gain. At the end of the feeding trial 12 birds were randomly picked up from each treatment group, sacrificed and their carcasses dissected.

Table 1 Percentage composition of broiler diet

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Rapeseed % | 0 | 10 | 15 | 20 | 25 |
| Ingredient | | | | | |
| Wheat | 47,90 | 44,00 | 42,40 | 40,0 | 38,30 |
| Soybean-meal | 39,00 | 36,00 | 34,00 | 32,40 | 30,60 |
| Lard | 9,00 | 6,00 | 5,00 | 4,00 | 2,50 |
| Rapeseed | 0 | 10,00 | 15,00 | 20,00 | 25,00 |
| Vitamin-pre-mix | 4,00 | 3,50 | 3,50 | 3,50 | 3,50 |
| DL-Methionin | 0,10 | 0,10 | 0,10 | 0,10 | 0,10 |
| Analysed (% od feed) | | | | | |
| Crude protein | 25,4 | 24,7 | 24,8 | 24,6 | 24,8 |
| Crude fat | 10,3 | 11,8 | 12,9 | 13,1 | 13,4 |
| ME/MJ | 13,3 | 13,3 | 13,5 | 13,2 | 13,2 |
| C18 -2+3 g/kg | 20,23 | 21,89 | 23,58 | 25,56 | 27,90 |
| Glucosinolates mmol/kg | 0 | 1,4 | 2,1 | 2,8 | 3,5 |
| Calculated g/kg | | | | | |
| Lysine | 12,5 | 12,7 | 12,6 | 12,7 | 12,7 |
| Met.+Cys. | 9,3 | 9,7 | 9,7 | 9,8 | 9,9 |
| Ca | 10,6 | 9,9 | 10,2 | 10,4 | 10,7 |
| P | 7,2 | 7,6 | 7,9 | 8,2 | 8,6 |
| Na | 1,9 | 1,7 | 1,7 | 1,7 | 1,7 |

Results and Discussion

Till to a level of 15 % rapeseed the growth was not adversely effected although the glucosinolate content rose to 1,4 millimol per kg feed and the feed intake was diminished (Table 2). From 20 % there was a significant decrease in live weight . With rising content of polyunsaturated fatty acids (C18-2+3) per kg feed in the average of the total trial the concentration of C 18 2+3 in the subcutaneous fat increased from 13,3 to 23,5 %. By shorten the interval of rapeseed feeding from 37 to 21 days the C18 2+3 content was decreased about 20 %. The results of this study indicate that broiler chicks can tolerate levels of 15 % rapeseed without detrimental effects. The enrichment with polyunsaturated fatty acids is desirable for human diets (Jakobsen1993).A test panel did not find differences in taste of muscle meats of carcasses from the different groups.

Table 2 Influence of rapeseed level on performance and contents of some polyunsaturated fatty acids in subcutaneous fat of broilers

| Group | Rape-seed level | Period of rape-seed feeding days | Live weight 37. day | Feed intake till to 37.day | Feed: gain ratio | Average C18 2+3 content per kg feed | C18 2+3 in subcuta-neous fat |
|---|---|---|---|---|---|---|---|
| | % | | g | g | kg | g | % |
| 1 | 0 | 1.-37. | 1742a | 3005 | 1,77 | 20,23 | 13,33 |
| 2 | 10 | 1.-37. | 1767a | 2912 | 1,69 | 21.90 | 18.35 |
| 3 | 15 | 1.-37. | 1733a | 2842 | 1,68 | 23,58 | 20,13 |
| 4 | 15 | 1.-21. | 1710ab | 2825 | 1,70 | 21,43 | 16,31 |
| 5 | 20 | 1.-37. | 1694b | 2786 | 1,69 | 25,56 | 21,00 |
| 6 | 20 | 1.-21 | 1687b | 2793 | 1,66 | 22,05 | 16,95 |
| 7 | 25 | 1.-37 | 1686b | 2727 | 1,66 | 27,90 | 23,47 |
| 8 | 25 | 1.-21. | 1665b | 2781 | 1,72 | 22,95 | 17,17 |
| 9 | 25 | 22.-37. | 1672b | 2852 | 1,75 | 25,22 | 19,37 |

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