



Influence of rapeseed cake, linseed cake and hemp seed cake on laying intensity, egg composition and fatty acid composition of egg yolk in laying hens

(Einfluss von Rapskuchen, Leinkuchen und Hanfkuchen auf die Leistungsmerkmale von Legehennen und das Fettsäuremuster der Eidotter) I. Halle and F. Schöne – Braunschweig (FLI) /Jena (TLL)

Oil seed meals, solvent extracted, and oil seed expeller=cakes are important protein and energy sources in animal feeding. Rapeseed was grown on 1.46 million ha in Germany in 2010 contrasting with only 6.86 thousand ha linseed and 1.2 thousand ha hemp. As protein feed, 3 million tons rape seed meal and 4.9 million tons other oil seed meals, mainly imported soya-bean meal were used. The objective of this study was to determine the effect of expeller/cakes from rapeseed, linseed, and hemp seed were investigated on feed intake, laying performance and fatty acid composition of egg yolk with laying hens. (Supported by the Thuringia Ministry of Agriculture, Nature Conservation and Environment, Erfurt, Germany, project Development of Analytical Methods – Quality Assessment, No. 92.02)

Methods

- 216 LSL laying hens were allocated to 9 groups with 24 hens per group.
- Hens were kept individually in a cage battery.
- Trial commenced when the hens were 22 wks. old and lasted for **6 laying months** (6x28 days).
- Feed and water were provided *ad libitum*.
- Eggs laid were recorded daily and feed consumption monthly.
- In the 6th laying months the egg and fatty acid composition of yolk were examined.
- Treatments:
Rapeseed cake (CP 295 g/kg, glucosinolates 21 mmol/kg): 5 / 10 / 15 %
Linseed cake (CP 322 g/kg): 5 / 10 / 15 %
Hemp seed cake (CP 281g/kg): 5 / 10 / 15 %

Results (Tab. 1)

- For feed intake, egg mass production and feed-to-egg mass ratio at 15% dietary cake level a significant lower performance was shown compared with the 5% and 10% cake level groups.
- Egg mass production was lower in the linseed cake groups than in hempseed groups; hens fed the linseed cake needed significantly more feed per kg egg mass compared with both other cakes tested.
- Increasing dietary level of all oil seed cakes lowered the yolk percentage and increased the egg white percentage.
- Linoleic acid and the linolenic acid were heightened by increasing the cake levels from 5 to 10 and 15% in the diet.

Table 1. Laying performance of hens, egg and fatty acid composition (Means, Anova, P-value)

Group/Cake	Feed Intake g/h/d	Laying intensity %	Egg weight g/egg	Egg mass g/hen/d	Feed/ egg mass kg/kg	Egg yolk %	Egg albumen %	C18:2 n-6, %	C18:3 n-3, %
Rapes. - 5%	107	96	59	57	1.90	28	60	18	1.1
Rapes. - 10%	106	96	58	56	1.90	27	60	21	1.6
Rapes. - 15%	104	96	58	56	1.88	26	61	22	2.0
Linseed - 5%	110	97	59	57	1.95	28	60	20	2.4
Linseed - 10%	110	95	59	56	1.97	27	62	23	4.4
Linseed - 15%	106	90	58	53	2.04	26	61	22	5.1
Hemp - 5%	107	96	58	56	1.94	29	60	19	1.6
Hemp - 10%	111	97	60	58	1.93	28	60	23	2.6
Hemp - 15%	107	95	60	57	1.89	27	61	25	3.0
Cake	<0.001	<0.001	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cake dosis	<0.001	<0.001	0.6	<0.01	0.9	<0.01	<0.01	<0.01	<0.01
Cake x dosis	<0.01	<0.001	<0.01	<0.001	<0.01	0.2	0.2	<0.01	<0.01

Conclusion:

The results allow the conclusions that compounds feeds with up to 10% of rapeseed cake, linseed cake or hemp seed cake do not negatively influence the laying performance of hens and provide the possibility of the enrichment of yolk fat with PUFA also of the n-3 type.