Different oil and fat sources in diets of fast-growing broiler chickens: Effect on performance and carcass traits

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Introduction

Oils and fats play an important role in animal nutrition. They serve multiple critical functions and are a vital component to increase the energy density of the diets. Broiler diets are designed to be highly digestible and energy-dense to ensure rapid growth and high-quality meat production within a short rearing period. To cover those requirements, dietary fats are supplemented at relatively high levels. To ensure constant pellet quality spray-cooled fat powders might be used as a perfect alternative to liquid oils or fatty-acid mixtures. The digestibility of dietary fats is influenced by their origin (animal-based or plant-based) as well as their specific fatty acid composition. Moreover, the type of dietary fat may impact fat metabolism and deposition within the body. Therefore, the aim of the present study was to determine the effects of three different fat and oil sources on performance and carcass traits in fast-growing broiler chickens.

Material and Methods

- 198 one-day-old male broiler chickens (Ross 308; 48 ± 4.2 g) were distributed among 18 pens (11 birds each)
- The 18 pens (6 replicates per experimental group, 66 birds per feeding group) were distributed to three feeding groups
- Feeding groups and timeline:
  Day 1-10: Starter diet (all feeding groups)
  Day 11-23: Grower diet
  FG1: basal diet (BD) + 3.6 % soybean oil
  FG2: BD + 3.6 % **BEWI-SPRAY®** 99 L
  FG3: BD + 1.0 % **BEWI-FATRIX®** SynerG+ + 2.8 % **BEWI-SPRAY®** 99 L
  Day 24-35: Finisher diet
  FG1: BD + 3.4 % soybean oil
  FG2: BD + 3.4 % **BEWI-SPRAY®** 99 L
  FG3: BD + 1.0 % **BEWI-FATRIX®** SynerG+ + 2.6 % **BEWI-SPRAY®** 99 L

Table 1: Calculated chemical composition of the basal diets (g/kg DM)

Basal diet	Grower phase	Finisher phase
Crude protein	210	196
Crude fat	33.1	33.7
Crude ash	50.6	44.4
Crude fiber	27.5	26.8
AME_N (MJ/kg)	11.6	11.9
Starch	369	424
Calcium	6.9	5.8
Phosphorus	4.9	4.2
Lysine	12.6	11.5
Methionine	6.0	5.6

Results

Table 2: Results of various fat sources on zootechnical performance of the broiler chickens

	FG1	FG2	FG3	SEM	p-value
Body weight, g					
Day 10	411	410	417	2.64	0.443
Day 23	1522	1544	1570	10.29	0.152
Day 35	3020	3016	3086	19.68	0.270
Average daily weight gain, g/d					
Day 0-10	36	36	37	0.25	0.456
Day 11-23	85	87	89	0.67	0.142
Day 24-35	125	123	126	1.11	0.409
Feed conversion ratio, kg/kg					
Day 10	1.00	1.01	0.98	0.02	0.729
Day 11-23	1.25	1.22	1.27	0.02	0.400
Day 24-35	1.53	1.46	1.48	0.02	0.519

FG, feeding group; SEM, standard error of means.

Table 3: Results of various fat sources on slaughter performance and carcass traits of broiler chickens (at day 35).

	FG1	FG2	FG3	SEM	p-value
Body weight, g	2935	2934	2996	19.28	0.323
Dressing, %	73.3^{b}	73.9^{ab}	74.5^{a}	0.14	0.002
Liver, g	43.7	43.0	43.7	0.40	0.675
Caracass weight, g	2138^{b}	2221^{ab}	2277^{a}	16.94	0.002
Breast, g	675^{b}	746^{a}	747^{a}	10.34	0.002
Breast, %	31.5^{b}	33.6^{a}	32.8^{ab}	0.33	0.021
Legs, g	600	594	601	6.87	0.913
Wings, g	219	220	231	2.26	0.061

^{a,b} Values within a row with different superscripts differ significantly ($p \leq 0.05$); FG, feeding group; SEM, standard error of means.

Conclusion

- To cover the nutritional needs, e.g. metabolizable energy, in broiler nutrition using fat and oil sources is crucial to optimize efficiency in fattening and hence economic success.
- The utilization of the fat sources is affected by numerous factors such as the age of the birds, the amount of inclusion as well as physical aspects like source, quality and particle size of the fats.
- The addition of **BEWI-SPRAY®** 99L in combination with **BEWI-FATRIX®** SynerG+ resulted in higher dressing and increased carcass weight. **BEWI-SPRAY®** 99L, both alone and in combination with **BEWI-FATRIX®** SynerG+ led to a higher breast meat yield.

Literature

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