

GROWTH PERFORMANCE BY RABBITS FED DIETS CONTAINING VARIOUS  
LEVELS OF CORN OIL

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Introduction

level has been shown to increase /Thacker, 1956; Arrington et al., 1974; Richard et al., 1982/, as well as decrease /Parigi-Bini et al., 1974; Raimondi et al., 1974/ body-weight gain, or not to affect growth at all /Lebas, 1975/. The discrepancies between the outcome of the various studies cannot be explained satisfactorily. One explanation may lie in the facts that different background compositions of the diets were used, and that fat was added to the diets at the expense of isogravic amounts of carbohydrates /Beynen, 1988/. The addition of fat increases energy density of the diet, and also changes the intake of dietary components other than fat, including protein. It could be suggested that this problem can be overcome by the replacement of carbohydrates by fat on a calorie for calorie basis /Beynen, 1988/. In the present study this was done by isocaloric substitution of corn oil for corn starch and dextrose.

Materials and Methods

Random-bred, male rabbits of the New Zealand White strain were used. The rabbits were housed individually as described earlier /Beynen et al., 1986/. Food and water were provided ad libitum.

On arrival in the animal house the rabbits, which were aged about 6 weeks, were maintained on commercial rabbit pellets (Hope Farms, Woerden, The Netherlands) for 2 weeks. Subsequently, on the basis of their body weights, the rabbits were allocated to the experimental diets given in Table 1. The diets were in pelleted form. The dietary groups consisted of 8 animals each, except for the group fed the 8.6%-fat diet which consisted of 7 animals. The experimental period lasted 56 days. Body weights and feed intake were measured.

Table 1. Composition of experimental diets

Ingredients (g)	Dietary code (% fat, w/w)			
	2.0	4.1	8.6	19.4
Corn starch	255.85	233.35	188.35	98.35
Dextrose	255.85	233.35	188.35	98.35
Corn oil	20.0	40.0	80.0	160.0
Constant components <sup>1</sup>	468.3	468.3	468.3	468.3
Total (g)	1000.0	975.0	925.0	825.0

<sup>1</sup>The constant components consisted of (g): casein, 160; molasses, 100; cellulose, 150; dicalcium phosphate, 6.1; calcium carbonate, 6.2; magnesium carbonate, 0.7; magnesium oxide, 0.3; potassium bicarbonate, 18.0; sodium chloride, 5.0; vitamin premix, 12.0, and mineral premix, 10.0. The compositions of the vitamin and mineral premixes has been described /Beynen et al., 1986/.

#### Results and Discussion

Increasing the percentage of corn oil in the diet caused an increase in body-weight gain and feed intake, and lowered the feed conversion ratio (Table 2). These results are somewhat surprising. The addition of fat to the diet at the expense of carbohydrates increased energy density of the diet (kcal/g feed). Contrary to what would be expected, ad libitum intakes of feed (dry matter) were increased upon enrichment of the diet with fat. As a result, voluntary intakes of energy were elevated on the high-fat

diets. This implies that the rabbits did not regulate their caloric intake. Possibly, the high-corn oil diets were very palatable. It should be stressed that similar results might not be obtained with fat sources other than corn oil.

Table 2. Performance of the rabbits fed ad libitum

	Dietary code (% fat, w/w)			
	2.0	4.1	8.6	19.4
Body weight (kg)				
Initial	1.68 $\pm$ 0.16	1.67 $\pm$ 0.14	1.71 $\pm$ 0.13	1.71 $\pm$ 0.13
Final	3.01 $\pm$ 0.33	3.27 $\pm$ 0.30	3.36 $\pm$ 0.33	3.85 $\pm$ 0.33
Body-weight gain				
(g/day)	23.7 $\pm$ 3.8	28.5 $\pm$ 4.4	29.5 $\pm$ 6.0	38.3 $\pm$ 7.2
Feed intake				
(g/day)	94.6 $\pm$ 15.7	103.6 $\pm$ 15.6	107.5 $\pm$ 16.2	116.1 $\pm$ 12.2
Feed conversion				
(g feed/g gain)	4.0 $\pm$ 0.3	3.7 $\pm$ 0.4	3.7 $\pm$ 0.5	3.1 $\pm$ 0.3

Means  $\pm$  SD.

This study suggests that diets rich in corn oil may promote growth performance of rabbits. It remains to be established whether this observation extends to other fat sources. Another question to be addressed relates to the impact of high-fat diets on the composition and quality of the carcass of rabbits.

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Random-bred, male New Zealand White rabbits aged 8 weeks were fed semi-purified diets containing either 2.0, 4.1, 8.6 or 19.4% (w/w) corn oil. The various fat levels were incorporated into the diets by isocaloric substitution of corn oil for corn starch and dextrose. The diets were fed ad libitum for a period of 8 weeks.

The higher the percentage of corn oil in the diet, the higher were body-weight gain and feed intake (dry matter). The feed conversion ratio (g feed/g gain) was lowered on the high-fat diets. This study suggests that upon the feeding of high-fat diets with increased energy density, rabbits cannot regulate their caloric intake. This might be related to stimulus properties of such diets, i.e. enhanced palatability.

It remains to be established whether the present results extend to fat sources other than corn oil. In addition, the influence of high-fat diets on the composition and quality of the carcass of rabbits should be studied.

WACHSTUMSRATEN VON KANINCHEN NACH VERABREICHUNG VON DIÄTEN MIT VERSCHIEDENEN MÄISÖLKONZENTRATIONEN

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Männlichen New Zealand White Kaninchen wurden im Alter von 8 Wochen halbgereinigte Diäten verabreicht die entweder 2,0; 4,1; 8,6 oder 19,4% (Gw/Gw) Mäisöl enthielten. Die verschiedenen Fettspiegel von Mäisöl wurden mit isokalorischen Mengen Mäisstärke und Dextrose ausgetauscht. Die Diäten wurden während einer Periode von 8 Wochen ad libitum verabreicht.

Je höher der Prozentsatz von Mäisöl in der Diät, desto höher waren die Wachstumsrate und Futteraufnahme (Trockensubstanz). Die Futterumsatzrate (Gram Futter pro Gram Wachstum) war bei den fettreichen Diäten erniedrigt. Diese Arbeit lässt vermuten dass bei Fütterung von fettreichen Diäten mit erhöhter Energiedichte, Kaninchen ihre Energieaufnahme nicht kontrollieren können. Dies könnte im Zusammenhang stehen mit stimulierenden Eigenschaften von solchen Diäten, möglicherweise ein erhöhter Genuss.

Es sollte jedoch festgestellt werden ob die erzielten Resultate auch für andere Fettsorten als Mäisöl gelten. Weiters sollte der Einfluss von fettreichen Diäten auf die Zusammenstellung vom Körper und die Fleischqualität von Kaninchen erforscht werden.

