



Feeding Fats Safety

WP 2 - UPV



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3% OF FATTY MATERIALS INCLUDED IN FEED

EFFECTS ON

GROWTH PERFORMANCE

Body weight gain
Feed intake
Feed efficiency

DIGESTIBILITY

Dry matter
Organic matter
Gross energy
Crude protein
Ether extract
Neutral detergent fibre
Acid detergent fibre

CAECAL PARAMETERS

pH
Dry matter
NH₃
SCFA

HEPATIC FUNCTION

GGT
GOT
GPT
ALP

RENAL FUNCTION

Urea
Creatinine

TRANS FATTY ACIDS

NO EFFECTS ON GROWTH PERFORMANCE

but feed high
in *trans* fatty acids

induced substantial impairment of fat digestibility
having repercussion on energy digestibility

	LT	HT	P
<u>Digestibility (%)</u>			
Gross energy	60.5	58.2	0.025
Ether extract	73.3	56.7	<0.0001

was associated with lower SCFA concentration
in caecal content, maybe indicating some
impairment of microbial activity

	LT	HT	P
<u>SCFA (mmol/l)</u>	215	164	0.003

NO DIFFERENCES IN HEPATIC AND RENAL FUNCTION TESTS

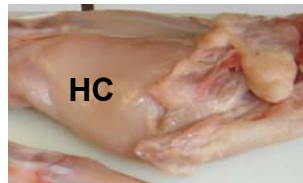
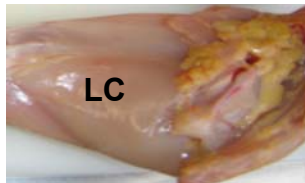
TRANS AND/OR SATURATED FATTY ACIDS ?

DIOXINS AND PCBs

GROWTH PERFORMANCE WAS POORER
WITH FEED LOW IN DIOXINS AND PCBs

	LC	HC	P
<u>Body weight gain (g/day)</u>			
28 to 56 days	43.6	46.6	0.005
56 to 63 days	31.0	40.3	<0.0001
<u>Feed efficiency</u>			
28 to 56 days	2.28	2.17	0.004
56 to 63 days	4.13	3.50	0.004

MOREOVER, CARCASS FROM FEED LOW IN DIOXINS AND PCBs
WERE NOT ACCEPTABLE COMMERCIALY



NO DIFFERENCES IN DIGESTIBILITY

DIOXINS AND PCBs

**FEED LOW IN DIOXINS AND PCBs
IMPAIRED HEPATIC FUNCTION**

	LC	HC	P
Transaminases			
GGT (IU/l)	14.63	8.25	0.003
GOT (IU/l)	116.4	78.3	0.003
GPT (IU/l)	163.0	71.1	<0.001

BUT SEEMED NOT AFFECT RENAL FUNCTION

**DID THE FEED LOW IN DIOXINS AND PCBs
INDUCE A TOXIC CHRONIC HEPATITIS ?**

DIOXINS AND PCBs

Quality and safety of fish oils for rabbits !!!

	LC Fish oil	HC Fish oil
Dioxins/PCBs (pg WHO-TEQ/g)	9.64	28.80
Elements (mg/kg)		
Ca	61	4.15
P	494.5	<4
As	8.2	<4
Fe	41.5	<4
Mg	27.5	<4
Zn	4.1	<4
p-anisidine value	58.8	8.2
Polymer content (%)	2.65	0.21
TBA value (µg MDA/kg)	2819	65

PAHs

NO EFFECTS ON GROWTH PERFORMANCE

but feed high
in PAHs

induced general impairment of digestibility but differences did not achieve statistical significance ($0.08 < P \text{ value} < 0.15$) because of residual variation abnormally high

was associated with higher NH₃ concentration in caecal content, maybe indicating higher proteolytic microbial activity

	LP	HP	P
NH ₃ (mmol/l)	5.56	11.69	0.041

NO DIFFERENCES IN HEPATIC AND RENAL FUNCTION TESTS

LIPID OXIDATION

NO EFFECTS ON

GROWTH PERFORMANCE

DIGESTIBILITY

CAECAL PARAMETERS

HEPATIC AND RENAL FUNCTION TESTS

SUMMARY

In our experimental conditions:

1. A high level of *trans* fatty acids (**12.4 vs. 0.65%**) in the fat included in rabbit feed impairs the fat digestibility, the energy value of feed and the fermentative activity in the caecum, but these effects can also be related with a parallel increase in the content of saturated fatty acids
2. More than their levels in dioxins and PCBs (**9.64 vs. 28.8 pg WHO-TEQ/g oil**), some other quality and safety factors of fish oils (to be elucidated) can affect growth performance, carcass quality and health of rabbits
3. A high PAHs content (**5290 vs. < 18 ng PAHs/g oil**) in acid oils included in rabbit feed seems impair its digestibility and increase the caecal concentration of NH₃
4. A high degree of lipid oxidation (**6.61 vs. 0.35% polymers and 67.43 vs. 2.74 p-anisidine values**) in vegetable oils included in rabbit feed had not negative effects on growth performance, digestibility and health of rabbits