

Essential fatty acids content in beef meat as influenced by crushed, flaked or extruded linseeds.

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Introduction

■ Beef meat

– source of:

- Protein
- Vit B12
- Zinc

– variable content of fatty acids



Introduction



■ Linseed: little seed

- Fat : 379 g/kg DM
- Protein : 230 g/kg DM
- C18:3 n-3 : 53 mol %

has been suggested to ENRICH BEEF MEAT

Introduction

■ Linseed: small size - requires processing :

Aims :

- Incorporation of 6.5 % linseeds in a fattening diet.
- Comparison of 3 treatments :
Crushing – Flaking – Extrusion.
- Culled cows – young growing fattening bulls.



Extrudeur INTERAGRI



Floconneuse SCHYNS

Materials and Methods



	Fattening diets			
	Control	Crushed	Linseeds Flaked	Extruded
Ingredients (g/kg)				
Barley	80	80	80	80
Spelt	80	80	80	80
Wheat	40	40	46	9
Bran	80	80	80	98
Maize	80	80	80	80
Sugar beet pulp	430	398	391	418
Molasses	40	40	40	40
Soya bean meal	80	85	85	85
Linseed meal	80	39	39	39
Mineral mixture	10	10	10	10
Linseed	-	68	69	61
+ 150 mg/kg vitamine E				

Materials and Methods

- Animals: Belgian Blues
- 3 trials: 16 culled cows,
20 growing fattening bulls,
16 culled cows.



Materials and Methods

■ Measurements :

- Farm : intake, live weight
- Slaughterhouse : carcass : pH – t°
- Meat plant : meat pieces
- Laboratory : meat quality
chemical composition
FATTY ACIDS PROFILE



Results

Chemical composition of diets



Components (g/kg DM)	Linseeds			
	Control	Crushed	Flaked	Extruded
Proteins	175	173	171	171
Ether extract	32	62	62	60
Fiber	116	121	119	123
Ca	7.8	9.0	7.9	8.2
P	4.7	4.1	4.2	4.3
C18:3 n-3 ⁽¹⁾	500	1591	1580	1551

⁽¹⁾ mg/kg DM

Results

Animals performances



	Growing fattening bulls	Culled cows
n	20	32
Initial age (months)	15.9	65.4
Initial live weight (kg)	423	648
Final live weight (kg)	556	747
Total live weight gain (kg)	133	99
Fattening period (d)	100.7	94.7
ADG (kg/d)	1.324	1.036
Intake kg/animal	770	979
kg/day	7.6	10.3
FCR (kg / kg)	5.9	11

Results

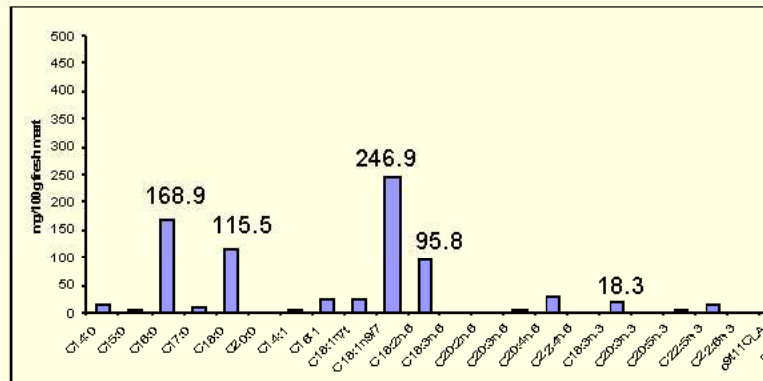
Chemical composition of meat



	Diet				
	Con	Cru	Fla	Ext	P
DM	24.7	24.64	24.69	24.58	NS
OM	95.7	95.72	95.68	95.69	NS
ash	4.3	4.28	4.32	4.31	NS
Protein	92.06	92.77	92.46	92.83	NS
EE	3.37	3.34	3.11	3.42	NS
NFE	1.06	0.37	0.59	0.38	NS

Results

Chemical composition of meat



Results

Fatty acids content in meat

	Con	Cru	Fla	Ext	P
C14:0	13.29	13.66	11.35	12.16	NS
C16:0	185.1	171.6	152.3	166.5	NS
C18:0	124.4	111.8	109.5	116.1	NS
C16:1	22.83	22.96	18.63	20.56	NS
C18:1n7t	19.47	23.79	20.19	22.2	NS
C18:1n9/7	269.7	246.3	226.2	245.4	NS
C18:2n-6	99.06	91.93	95.87	96.5	NS
C20:3n-6	8.93 ^a	6.58 ^b	7.09 ^b	6.87 ^b	***
C20:4n-6	30.61	26.94	27.05	25.82	NS
C22:4n-6	2.62 ^a	1.92 ^b	1.95 ^b	2.00 ^b	**
C18:3n-3	13.8 ^a	20.4 ^b	19.2 ^b	19.6 ^b	***
C20:5n-3	7.06	7.34	7.62	7.33	NS
C22:5n-3	13.86	13.21	13.71	14.05	NS
c9t11CLA	3.31	3.47	3.25	4.08	NS



Results

Fatty acids content in meat



	Con	Cru	Fla	Ext	P
C18:3n-3	13.8 ^a	20.4 ^b	19.2 ^b	19.6 ^b	***
C18:3n-6	0.73 ^a	0.48 ^b	0.49 ^b	0.54 ^b	**
C20:2n-6	1.44 ^a	1.09 ^c	1.24 ^b	1.19 ^{bc}	***
C20:3n-6	8.93 ^a	6.58 ^b	7.09 ^b	6.87 ^b	***
C22:4n-6	2.62 ^a	1.92 ^b	1.95 ^b	2.00 ^b	**
Σn-3	37.6 ^a	43.8 ^b	43.5 ^b	43.8 ^b	**
Σn-6	143 ^a	128 ^b	133 ^b	132 ^b	***
n-6 / n-3	3.98 ^a	3.07 ^b	3.28 ^b	3.21 ^b	***

Conclusions

- Linseed at an incorporation rate of 6.5% increased the n-3 content but
NO ENRICHMENT in Belgian Blue
beef meat



Conclusions

- No differences between treatments
Crushing = Flaking = Extrusion



Thanks for your attention

