

The influence of dietary conjugated linoleic acid (CLA) on serum leptin concentration in lactating sows.

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Introduction Conjugated linoleic acid (CLA) is a mixture of geometrical and positional isomers of linoleic acid. Health-promoting properties of CLA, which include antioxidant, anti-obesity and anticarcinogenic activities, have been demonstrated in a wide range of animal models (Pariza *et al.*, 2001). Recent studies indicated the CLA has a favorable effect on immune competence in nursery (Bassaganya-Riera *et al.*, 2001) and weaned pigs (Corino *et al.*, 2001). For this reason CLA may be useful in sow nutrition to increase CLA content in colostrum and milk (Bee, 2000). However CLA-fed animals displayed also significantly reduced body fat (Pariza *et al.*, 2001) and this effect may be detrimental to reproductive efficiency in sows *per se* and for the effects on metabolic hormones as well. Moreover some CLA isomers has been reported to influence leptin gene expression (Houseknight *et al.*, 1998). The present study examined the effects of dietary supplement of CLA on serum leptin in lactating sows.

Materials and methods Sixteen Large White sows were divided into two experimental groups, control and treated. Starting on 15 days before parturition and continuing through lactation, treated animals were fed the control diet supplemented with 0.5% CLA preparation in free fatty acid form. The CLA mixture contained approximately 50 % of pure CLA isomers, 50% *cis 9, trans 11* isomer, and 50% *trans 10, cis 12* isomer (from certificate of analysis provided by the manufacturer). Body weight and Body Condition Score (BCS) were recorded before parturition and at weaning (21 d). Feed intake was measured daily. Blood samples were taken at 2, 10 and 20 days of lactation. Serum leptin concentrations, expressed as ng/mL human equivalent (HE), were determined with a commercially available radio-immunoassay procedure; the antibody was raised against human leptin and displayed 67% cross-reactivity to porcine leptin and detection limit of 1 ng/ml HE (Multi-Species Leptin RIA Kit, Linco Research Inc., MO, USA).

Results CLA dietary supplementation did not affect body weight and BCS of the sows during lactation (Table 1). Average daily feed intake tended to be lower in CLA supplemented sows than in control, although no significant difference was observed. Average serum leptin concentration resulted significantly higher in sows fed CLA (2.37 vs 2.01 ng/ml HE, s.e.m=0.08) ($P<0.01$) (Figure 1). However it does not seem to be a relation between daily feed intake, body condition of sows during lactation and leptin release.

Conclusions These results indicate that dietary CLA does not influence feed intake and body condition. in lactating sows. By these results it does not seem that circulating leptin in lactating sows may be related by body weight and body condition as established in humans and rodents. Further research could explain if the higher leptin level in CLA fed sows is due to changes in leptin gene expression or in leptin clearance as well.

Acknowledgements The research project was supported by the Italian Ministry for Universities and Scientific and Technological Research (Cofin.2000). The authors wish to express thanks to Pharnutrients for providing the Conjugated linoleic acid (CLA) supplement for this project.

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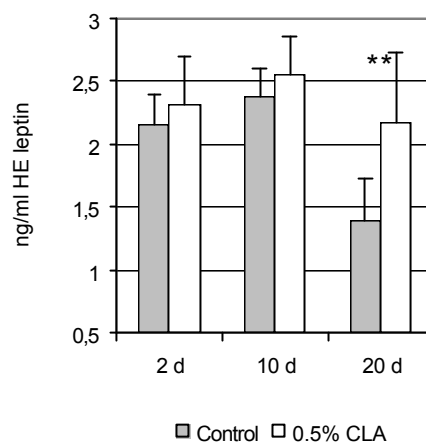


Fig.1 Serum leptin in lactating sows (mean \pm s.d.)

Tab.1- Feed intake, body weight, and body condition of sows (means \pm s.d.)

	Ctr	CLA	P
Sows, n	8	8	
Daily feed intake, kg/d	4.54 \pm 0.63	.28 \pm 0.70	
Body weight, kg			ns
Before parturition*	225 \pm 31	233 \pm 44	
At weaning (21 d)	201 \pm 28	202 \pm 42	ns
BCS**			ns
Before parturition	2.65 \pm 0.32	2.68 \pm 0.19	
At weaning	2.34 \pm 0.42	2.36 \pm 0.35	ns

* 7 d before parturition **Body Condition Score