

Evolution of blood parameters during weight loss in experimental obese Beagle dogs

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The objectives of this study was to measure the effects of weight loss on blood parameters in 8 adult experimental obese Beagles (4 neutered males and 4 intact females, 5.5 (range 4-7) years) fed either a high protein, low starch and high fibre dry expanded diet –DP –(crude protein 44.1 %, fat 8.7 %, crude fibre 10.0 %-as fed) or a commercial moderate protein, high starch and high fibre dry diet -HF- (crude protein 21.6 %, fat 7.7 %, crude fibre 21.0 %-as fed). The dogs were allotted into 2 groups matched for sex, body scores and body weight (BW) at baseline and were fed either the DP or control HF diet for 12 to 26 weeks, until they reach their optimal BW (Diez et al., 2002) Dogs underwent hormonal and biochemical evaluation monthly (carnitine, creatinine, urea, free T4 (FT4), total T4 (TT4), plasma alkaline phosphatases (ALP), aspartate aminotransferase (AST), alanine aminotransferase (ALT), potassium, total proteins) or bimonthly (cholesterol, triglycerides, non-esterified fatty acids (NEFA), IGF1, glucose, insulin) over the whole study. Blood parameters were assayed by standard procedures and results were analysed by SAS Mixed Procedure for longitudinal data with treatment (diet) and sex as fixed effects .

Results. Dogs reached their optimal BW within 12 to 24 weeks for the HF group and 21 to 26 weeks for the DP group (Diez et al., 2002).

Before weight loss, plasma triglycerides and cholesterol concentrations were respectively (mean \pm SEM) 0.75 ± 0.02 and 2.49 ± 0.02 g/l for the obese dogs. The 2 diets decreased the plasma concentrations of these 2 metabolites but the difference was only significant for the DP diet. The basal plasma mean NEFA concentration was 0.40 ± 0.03 mM/l and increased regularly over the period with the HF diet but the difference between the 2 diets was not significant.

Over the weight loss, mean plasma carnitine concentration ranged between 21 ± 2.08 and 28.3 ± 4.9 μ M/L with no difference between the diets. Mean urea and creatinine plasma concentrations ranged respectively between 0.185 ± 0.01 and 0.358 ± 0.04 g/l and between 7.4 ± 0.4 and 9.9 ± 0.7 mg/l without difference between the 2 diets. No effect of diet was observed on overnight fasted plasma ALP, AST, ALT, potassium, TT4, FT4, IGF1, glucose and insulin which remained constant over the weight loss period. Blood urea and IGF1 concentrations were significantly higher in females than in males over the study ($P < 0.05$). Weight loss induced a decrease in FT4 plasma concentrations : 12.5 ± 0.7 ng/l in obese dogs versus 7.7 ± 0.6 ng/l at the end of the weight loss ($P < 0.001$). Mean plasma concentration of ALP was higher in males than in females ($P < 0.05$).

In conclusion, there was only an effect of diet on plasma cholesterol and triglycerides levels. Weight loss induced significant decreases in plasma cholesterol, triglycerides and FT4, whatever the diet offered. Based on blood parameters, at the tested energy intake, both diets assured a safe weight loss.

References

Diez M. et al., 2002. J. Nutr. 132 S (in press)