INTRODUCTION

The use of animal fat (mainly saturated fat) in poultry diets has been reduced due mainly to two reasons: the higher healthy benefits of unsaturated fat in human nutrition and the restrictions in the use of animal fat in animal nutrition. Unsaturated fatty acids are better absorbed and thus provide more metabolizable energy to the animal. But it remains unclear in poultry if this "extra" energy uptake results in higher fat deposition.

OBJECTIVE

This study was designed to assess the effect of dietary polyunsaturated fatty acids (PUFA) on the total fat content of broilers, measured as hydrolysed crude fat (CF) and as total fatty acids (TFA) content.

MATERIAL AND METHODS

Animals: 96 female broiler chickens

Treatments: 4 dietary unsaturation levels: 15, 34, 45 and 61 g PUFA/kg diet (achieved by replacing linseed and fish oil to a basal diet with 9% tallow).

Samples: 96 animals slaughtered at 44 days (2318 ± 109.8 g)
Whole chickens (including blood and feathers) minced and freeze-dried.

Analysis:
- Crude fat (CF) crude protein (CP), ashes (A) and gross energy (GE) content.
- Total fatty acids (TFA) content (quantification: C19:0 as internal standard).

RESULTS

The chemical composition of the whole animal body (% of DM) is shown in figure 1. CP and A content are not affected by treatment. But nevertheless CF is drastically reduced (up to 55%, p<0.001) when dietary PUFA content increases from 15 to 61 g/kg.

The total chemical composition (TTC, considered as the sum of CF, CP and A, being negligible the carbohydrate amount) on a DM basis should be close to 100%. Only in the more saturated treatments is this true, reaching only 80% when feeding 61 g dietary PUFA/kg. This finding suggests that CF analyses of highly unsaturated samples may underestimate body fat content.

Figure 1: Effect of dietary PUFA on the chemical composition of the whole chicken (% of DM): ashes, crude protein and crude fat content. (Different letters indicate differences in crude fat content).

CONCLUSION

Our work showed a reduction of the energy storage (mainly body fat) as the PUFA intake increased and that total fatty acids content can be an acceptable estimator of the whole body fat content, and was even more precise than hydrolysed crude fat determination in the case of highly unsaturated meats.