Chemical composition and nutritive value of leather meals in broilers

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The shortage of protein resources for feed is becoming critical in China due to rapid growth in the feed industry during recent years. Alternative sources of protein therefore need to be evaluated as they become available. A by–product of the leather industry is one such source that is available in considerable amount in China, particularly in Inner Mongolia. Hydrolysed leather meal can be used in feeds for pigs (Nematillaev 1982) and poultry (Jiang *et al.* 1992) as a protein supplement. Two experiments were conducted to investigate the effect of extraction conditions on the chemical composition and nutritive value of chrome leather scraps from cattle, sheep and pig hides. Experiment 1 was carried out to maximise the protein recovery rate from the three types of leather scraps under various extraction conditions, i.e. concentrations of $Ca(OH)_2$, time and temperature of incubation; Experiment 2 investigated the digestibility of the protein in the three meals using 8–week old Arbor Acres broilers. A total of 36 birds were divided into 3 groups, and each group was again divided into basal and test diet subgroups. In the test diet, 15% of the basal diet was replaced by leather meal. The optimum temperature, concentration of $Ca(OH)_2$ and duration of extraction for cattle, sheep and pig hides were: 90°C, 2.5% $Ca(OH)_2$, 2 h; 90°C, 4.0% $Ca(OH)_2$, 5 h; and 90°C, 1.5% $Ca(OH)_2$, 4 h, respectively. Under these conditions the recovery rates of leather meal from cattle, sheep and pig hides were 79.90, 74.33 and 83.98%, respectively. The table shows the chemical composition and protein digestibility values.

This study indicates that it is important to employ different extraction conditions for cattle, sheep and pig hides to maximise the protein recovery in leather meal. The chemical composition of meals of different origins differs widely but the protein digestibilities in broiler chickens are similar.

Table 1 Composition of leather meals from cattle, sheep and pig hides, and digestibility of the protein in broilers.

	Cattle	Sheep	Pigs	Difference
Protein %	80.1[a]	53.7[c]	62.2[b]	*P*<0.01
Fat %	6.8[b]	9.6[a]	7.8[b]	*P*<0.05
Total ash %	8.7[b]	22.5[a]	20.9[a]	*P*<0.01
Protein digestibility %	67.5[a]	63.5[a]	58.2[a]	NS

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