J.Meat Sci., 2011, 7(2) : 52 - 53 Research Note

Fatty Acid Analysis Of Neatsfoot Oil From Cattle and Poultry

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ABSTRACT

The yield of crude neatsfoot oil from cattle and poultry was 8.77 and 0.12 % respectively. The colour of oil from cattle was yellow and that from poultry was straw green. Fatty acid analysis revealed the oleic and linoleic acid (%) as 40.95 and 50.30% for cattle and 35.25 and 2.1% for poultry, respectively.

Key words: *Cattle feet, poultry shank and claw, neatsfoot oil, fatty acid composition.*

Neatsfoot oil is an important slaughter house by-product. Neatsfoot oil is pale, golden-yellow oil obtained from shin bones i.e. metacarpal and metatarsal and phalangeal bones of cattle or small ruminants or poultry claws by a process of wet rendering (Kulkarni *et al* 1986 and 1994). Neatsfoot oil is used for dressing leather and as lubricant for delicate machinery in the textile industry.

Cattle feet (nondescript breed) and shanks along with claws of the broiler poultry were collected from local slaughterhouse. For cattle the last two phalanges were separated after removing the hoof cover and they were cut into small pieces, while for poultry the shanks and claws were cut into small pieces. The raw material was weighed and subjected to wet rendering in the domestic pressure cooker at 15 psi for 4 hrs as per Kulkarni *et al* (1986). The oil floating on the surface was collected and washed with hot water followed by normal saline solution to remove soluble proteins using separating funnel and then the oil was filtered through Whatman filter paper no.1 to get crude neats foot oil. The yield was recorded. The fatty acid composition of the oil was determined using GLC, Chemito Cerus, 800 plus model.

The yield of crude neats foot oil for cattle and poultry was 8.77 and 0.12 % respectively. Kulkarni *et al* (1986) reported average yield from feet of adult and male buffalo calves as 7.28 and 6.16 %, respectively at 1.4 kg pressure, while Mittal *et al* (1990) reported a yield of 13.6% from adult buffalo hooves at 6.8 kg pressure and Narayana Raju *et al* (2006) reported a yield of 11.38%. from cattle feet (non descript breed). Kulkarni *et al* (1994) reported a yield of 0.06 % from broiler poultry shank. The difference in the yield might be due to pressure and duration of cooking The colour of oil from cattle was yellow and that from poultry was straw green.

The fatty acid composition (Table 1) revealed Oleic acid as major fatty acid as 40.95% and 50.3 % in cattle and poultry, respectively; followed by Linoleic acid (35.5%) in cattle and Palmitic acid (17.6%) in poultry. The values of Linoleic acid reported in the present study as 35.5 % and 2.1 % in cattle and poultry, respectively were different from the reports of Cattaneo *et al* (1959), Kulkarni *et al* (1986) and Mittal *et al* (1990) who reported Linoleic acid % as 12.1 % in cattle knuckle bones; 2.5 % in adult buffalo hooves and 12.64 % in adult buffalo hooves, respectively. The variation in the values may be due to difference in methodologies used for extraction and variation in analysis procedures. The reports on the fatty acid composition of oil from poultry shanks could not be traced in the available literature.

It can be concluded that slaughterhouse by-products like cattle feet and poultry shanks can be used for extraction of value added products such as neatsfoot oil for increasing profit margin.

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Table 1: Fatty acid composition of the oil extracted form cattle feet and poultry shank along with claws

Fatty acid	Cattle(%)	Poultry (%)
Myristic acid, C14:0	0.4	1.65
Myristoleic acid, C14:1	0.2	1.6
Palmitic acid, C16:0	11.9	17.6
Palmitoleic acid ,C16:1	2.05	8.25
Heptadecanoic acid, C17:0	0.3	0
Stearic acid, C18:0	4.35	9.19
Oleic acid ,C18:1	40.95	50.3
Linoleic acid, C18:2	35.5	2.1
Linolelaidic acid ,C18:2, (iso)	0.55	0
Linolenic acid C 18:3	0.1	0.7
Arachidic acid, C20:0	0.35	1.05
EPA-Ecosapentaenoic acid, C20:5n-3	0.15	1.65
DHA, Docosahexaenoic acid, C22:6n-3	0.35	0.1
Total	97.15	94.19
Others	2.85	5.80

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