XXI. EUROPÄISCHER KONGRESS DER FLEISCHFORSCHUNGSINSTITUTE

ALLUNIONS-FORSCHUNGSINSTITUT DER FLEISCHINDUSTRIE DER UdSSR

BESTIMMUNG DER AUSBEUTE UND DER CHEMISCHEN ZUSAMMENSETZUNG VON HAMMELKNOCHEN SOWIE STUDIUM DER FETTSÄUREZUSAMMENSETZUNG DES DAVON GEWONNENEN FETTES

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Z U S A M M E N F A S S U N G

Zum erstenmal wurden die Untersuchungen zur Bestimmung der chemischen Zusammensetzung und der Ausbeute von verschiedenartigen Hammelknochen und zur Festlegung von chemischen Grundmerkmalen, die die Qualität des davon gewonnenen Fettes charakterisieren, durchgeführt.

Mit Gas-Flüssigkeits-Chromatographie wurde die Fettsäurezusammensetzung des gewonnenen Hammelknochenfettes studiert.

Es wurde festgestellt, daß unter gesättigten Fettsäuren die Palmitinsäure (18,7-26,6%) und unter ungesättigten die Ölsäure (36,5-55,1%) den höchsten Anteil im Hammelknochenfett ausmachen.

Es wurde die Möglichkeit der Ausnutzung von Hammelknochen als zusätzliche Rohstoffsquelle für die Gewinnung des Nährfettes gezeigt.

XXI ЕВРОПЕЙСКИЙ КОНГРЕСС РАБОТНИКОВ НИИ МЯСНОЙ ПРОМЫШЛЕННОСТИ

Всесоюзный научно-исследовательский институт мясной промышленности СССР

ОПРЕДЕЛЕНИЕ ВЫХОДА И ХИМИЧЕСКОГО СОСТАВА БАРАНЬЕЙ КОСТИ И ИССЛЕДОВАНИЕ ЖИРНОКИСЛОТНОГО СОСТАВА ПОЛУЧЕННОГО ИЗ НЕЕ ЖИРА

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А Н Н О Т А Ц И Я

Впервые проведены исследования по определению химического состава и выхода различных видов бараньей кости, а также основных химических показателей, характеризующих качество извлеченного из нее жира.

Методом газожидкостной хроматографии исследован жирнокислотный состав полученного бараньего костного жира.

Установлено, что в бараньем костном жире наибольший удельный вес из насыщенных жирных кислот занимает пальмитиновая (18,7-26,6%), а из ненасыщенных - олеиновая (36,5-55,1%).

Показана возможность использования бараньей кости как дополнительного источника сырья для получения пищевого жира.

XXIst EUROPEAN MEETING OF MEAT RESEARCH WORKERS

ALL-UNION RESEARCH INSTITUTE OF THE MEAT INDUSTRY

DETERMINATION OF THE YIELD AND CHEMICAL ANALYSIS OF SHEEP BONES AND A STUDY INTO THE FATTY ACID COMPOSITION OF THE FAT EXTRACTED THEREFROM

V.M.Gorbatov, S.G.Liberman, M.L.Faivishevsky, S.E.Pankova, A.A.Shmidt, I.U.Yusoupova, L.M.Yakoushina

S U M M A R Y

It is for the first time that the chemical composition and the yield of various sheep bones, as well as the basic chemical properties which characterize the quality of the fat extracted therefrom, were studied.

The fatty acid composition of the extracted sheep bone-fat was studied by means of GLC. It was found that, of saturated fatty acids - the palmitic one, and of unsaturated fatty acids - the oleic one, have the highest specific levels (18.7-26.6%) and 36.5-55.1%, respectively).

Possible use of sheep bones as an additional source of edible fat is demonstrated.

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At present, it is common practice - both at home and abroad - to produce edible fat, mainly, from bovine bones or, to a lesser degree, from pig bones. Full-fat ovine bones resulting from mutton processing into sausage, canned or culinary products are delivered to meat meal departments.

With prospects for increased production and commercial processing of mutton considered, the problem of a rational utilization of sheep bones as fatty raw material becomes urgent.

Both home and foreign literature avails of very scarce information on the yield and chemical analysis of the skeletal bones of mutton carcasses, as well as on the composition and characteristics of the bone fat obtained. It is in the recent years only that some papers on this question have appeared. E.g., the data are available on the fatty acid and glyceride compositions and the basic properties of the fat extracted only from feet and shin bones (1).

In order to fill a gap in such information, research was carried out to determine the yield and the chemical analysis of different skeletal bones of sheep carcasses as related to the fatness of the latter. Besides, fat yields from water defatting of various ovine bones, the fatty acid composition

2.

and chemical indices characterizing the extracted fat were investigated.

To find the ratio of different skeletal bones, 12 sheep carcasses of each of the three categories - first, second and lean ones - were selected, separately weighed and conventionally deboned. The bones obtained from each carcass were collected, graded and weighed. Bone samples of each kind were stepwise ground down to 2-3 mm. An average sample was taken for chemical analyses. Water, fat, ash and protein were determined by means of standard methods.

Average results on deboning yields for mutton of different fatness are given in Table 1.

Table 1

Bone yield from mutton deboning of different fatness

(%)

Bone	Mutton fatness		
	1st category	2nd category	Lean
Pelvic	1.7	2.1	2.4
Blade	1.0	1.4	1.5
Long	5.9	10.0	13.9
Ribs	3.0	3.8	4.8
Back vertebrae	3.8	3.8	5.2
Lumbar "	3.0	4.1	5.1
Cervical "	3.8	4.2	4.9
Breast	2.1	2.4	2.7
Total	24.3	31.8	40.5

It is obvious from Table 1, that skeletal bone yields as compared to carcasses weight increases notably with decreasing fatness, mainly, due to a higher share of long bones and vertebrae.

The chemical composition of the bones of mutton carcasses of different fatness is presented in Table 2.

3.

Tabelle 2.

Chemical composition of the bones of mutton carcasses of different fatness

(%)

Bone	Fatness category											
	1st				2nd				Lean			
	Water	Fat	Ash	Protein	Water	Fat	Ash	Protein	Water	Fat	Ash	Protein
Pelvic	426	175	208	190	436	123	295	146	451	115	194	240
Blade	378	69	343	210	513	67	227	193	393	69	318	220
Ribs	417	147	235	201	470	122	202	206	556	118	142	184
Back vertebrae	457	163	200	180	498	166	142	194	504	62	204	230
Lumbar "	507	161	180	152	514	145	146	195	559	115	150	176
Cervical "	575	115	140	170	565	96	128	211	582	74	142	202
Breast	461	307	102	140	470	273	73	184	582	134	100	184
Round	357	201	241	201	376	197	241	186	426	182	200	192
Shank	342	169	257	232	363	154	236	247	500	146	201	153
Fore shank	309	167	282	242	360	152	278	210	411	130	230	229
Arm	375	205	230	190	349	206	227	218	452	156	195	197
Fore shin	359	198	232	211	394	118	231	257	453	106	159	282
Hind shin	306	208	271	215	336	115	273	276	429	109	208	254

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To obtain fat samples, we used skeletal bones of sheep carcasses of the 1st fatness category. Fat was extracted from preground bones by means of water cooking at 95°C for 6 hrs and with liquids ratio of 1:1. The broth with fat was centrifuged to separate fat. The results are given in Table 3.

Table 3

Chemical analysis of cooked-out bones

(%)

Bone	Water	Fat	Ash	Protein
Pelvic	45.3	8.9	25.9	19.9
Blade	44.5	4.9	31.4	19.2
Ribs	55.3	9.9	21.9	12.9
Back vertebrae	48.6	8.7	24.2	18.5
Lumbar "	45.7	4.4	31.5	18.4
Cervical "	50.0	7.3	24.8	17.9
Breast	67.0	7.0	11.7	14.3
Round	28.2	9.3	42.7	19.8

According to the chemical analysis, fat content in cooked-out bones is still high enough and, therefore, additional processing is required to achieve more complete defatting.

Table 4 gives some chemical indices and yields of mutton bone fat.

As is seen from Table 4, fat yield varies within a broad range from 2.5 to 17.2% due to bone location.

By qualitative indices, mutton bone fat may belong to edible bone fats of the Extra and 1st grades.

As judged by its iodine number, it can be easily digested by the organism.

GLC analysis gave the fatty acid composition of the mutton fat rendered from different bones (Table 5).