

SOME RESULTS FROM THE CHEMICAL ANALYSES OF VEAL

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1. Introduction:

An investigation has been carried out by the Institute for Animal Breeding, in collaboration with the Experimental Station for the Butchers Trade on the carcass-composition of newly born calves.

The calves were native of two breeds: the Dutch-Friesian breed (black and white) and the Maese-Rhine-IJssel breed (red and white). The calves were taken at random from the two herdbrooks, so that the calves were thorough-bred. They were all male and the third calf of the cows.

In the period of January, 15th to June, 15 th, the carcass-composition of 43 calves was investigated (21 black and white, 22 red and white).

The object of our investigation was:

- 1^e To obtain the weights of the muscles, bones, etc. and the principal dimensions of the newly born calves.
- 2^e To study the differences between the newly born calves of the two breeds.
- 3^e To determine the chemical composition of the muscles of newly born calves.

The results of the two first objects of our investigation will be published elsewhere. In this paper the principal results from the third object of our investigation will be communicated.

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2. The chemical analyses of veal:

Through the above mentioned investigation of the carcass-composition of newly born calves, we have the opportunity to investigate the chemical composition of the muscles of these calves.

The calves were born in all parts of our country and they were collected and slaughtered once a week. At slaughter the age of the calves varied from 1 - $8\frac{1}{2}$ days (mean value 5 days). The period between slaughtering and cutting varied from $3\frac{1}{2}$ - 116 hours (mean value $45\frac{1}{2}$ hours). In this period the carcasses were stored refrigeration, packed with wet clothes in a polyethylene bag.

Determinations were made of the composition of one muscle of the right hind quarter (M. semimembranaceus) and a group of muscles of the right fore quarter (M. triceps brachii, M. infra spinam, M. deltoideus and M. teres minor), since one muscle of the fore quarter was too small for the determinations.

Further, some determinations were made on the liver and the fat, covering the kidney.

The choice as to what determinations were made was dependent on the capacity of the laboratory of the Experimental Station for the Butchers Trade, as one calf had to be analysed within one day.

3. Methods:

Preparation:

Before analyses, all the fat, connective tissue and membranes were removed from the muscle. The muscle was minced twice through a small meat-mincer. After that the following components were determined in the minced meat:

Water, by drying at 105°C , after mixing with sand.

Protein, by the macro-Kjeldahl method. The minced veal is destructed with sulfuric acid and selenium and copper-sulfate as a catalyst.

The protein is calculated as nitrogen multiplied by 6,25.

Fat, by extraction of the dried minced veal with pentane.

Ash, by treating with sulfuric acid and incineration at about 800°C . The ash-content is calculated by multiplying the sulphate-ash by $\frac{8}{9}$.

Waterbinding capacity,

by the method of Grau and Hamm. The content of free water was calculated.

Iron, by the method of Kniphorst (Chem. Weekbl. 42, 311-316, 328 - 334). The minced meat was destructed with sulfuric acid and nitric acid. After addition of sulfosalicylic acid and ammonia the yellow color is measured by a colorimeter, and the iron-content is calculated.

pH , by measuring with a Radiometer pH-meter.

The iron-content of a part of the liver (Lobus quadratus) was determined according to the above mentioned method.

In the fat, covering the kidney, the iodine value was determined according to the Wyss-method.

All determinations were duplo-determinations, with the exception of that of the waterbinding capacity, which was a triplo-determination.

4. Results:

The mean values of these determinations are presented in table 1.

Also the maximum and minimum values and the standard-deviations are shown in this table.

In column 2 the mean differences between the duplo determinations are given.

5. Discussion:

The results will be discussed during the projection of 9 slides. Each slide shows the distribution of the duplo observations among the different values (frequency-curves).

Summary:

The composition of some muscles of newly born calves has been determined. The mean values of the analyses of 43 calves are reported. The following analyses has been carried out: in the muscles: water, protein, fat, ash, waterbinding capacity, iron and pH; in the liver: iron; in the fat: iodine value.

Zusammenfassung:

Die Zusammensetzung von einigen Muskeln von Kälbern bis 8 Tagen alt ist festgestellt. Die Mittelwerte von 43 Kälbern worden gegeben. Die folgende Komponenten sind bestimmt worden: in den Muskeln: Wasser, Eiweisz, Fett, Asche, Wasserbindungsvermögen, Eisen und pH; in der Leber: Eisen und in dem Nierenfett: Jodzahl.

Resumé:

La composition de quelques muscles des veaux tout jeunes est déterminé. Les valeurs moyennes de 43 veaux sont communiqué. Les dosages suivantes sont déterminé: dans les muscles , de l'eau, de la protéine, de la matière grasse, du cendre, du fer, pouvoir de rétention d'eau et pH; dans le foie: du fer et dans la capsule graisseuse du rein: la valeur d'iode.

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Table 1. Composition of muscles of newly born calves.
Mean values of the analyses of 43 calves.

1 Component	2 Mean diff.	3 Min. value	4 Mean value ± stand.dev.	5 Max. value
Watercontent of the muscle	0,1 %	77,6 %	79,2 % ± 0,6 %	80,9 %
Proteincontent of the muscle	0,1 %	18,0 %	19,0 % ± 0,5 %	20,2 %
Fat content of the muscle	0,04 %	0,29%	0,46 % ± 0,009%	0,65%
Ash content of the muscle	0,03 %	1,08%	1,17 % ± 0,05 %	1,36%
Free watercontent of the muscle	5 %	27 %	38,5 % ± 5 %	53 %
Ironcontent of the muscle	1 mg/kg	7,0 mg/kg	12,0 ± 4 mg/kg	25,0 mg/kg
pH of the muscle	-	5,40	5,61 ± 0,2	6,10
Ironcontent of the liver	4 mg/kg	38 17 mg/kg	120 ± 90 mg/kg	330 mg/kg
Iodine value of the fat	0,5	47,75	50,4 ± 2	56,0