

VARIATION IN THE NITROGEN CONTENT OF LEAN PORK MEAT

S.M. Herschdoerfer, M.G. John, and J.H. Halliday

In the United Kingdom the meat content of comminuted meat products - such as sausages, luncheon meat, etc. - is determined by a method published by Stubbs and More (Analyst 1919, 44, 125) and modified by the Analytical Methods Committee (Analyst 1952, 77, 544). In this method the nitrogen, fat, ash and water content of the product is determined and, after making due allowance for nitrogen derived from bread or other cereals included in the formula, the total meat content is obtained from the following formula

$$\% \text{ total meat} = \frac{\% \text{ nitrogen (less cereal nitrogen)} \times 100}{f} + \% \text{ fat}$$

The Analytical Methods Committee recommended that 3.6 should be used in the above equation in analysing pork products, but evidence has been accumulating that, owing to the different nitrogen contents of meat from different parts of a pig's carcass, an analysis based on such a factor might give misleading results. There are also indications that this figure might not represent the correct mean factor for the whole edible meat from the pig. Some time ago the Society for Analytical Chemistry appointed a Sub-Committee of the Analytical Methods Committee to review the methods used in the analysis of meat products and to recommend, if possible, new or improved methods for this purpose. The Committee has now collected a considerable amount of information on the nitrogen content of various parts of pig and beef carcasses and hopes to be able to issue a preliminary report later this year.

In connection with the data required by the Committee, many analyses were carried out in various laboratories, and it is the purpose of this paper to describe a recent series of such analyses carried out by the authors.

Pigs selected for analysis fell into two weight groups, i.e. 200-220 lbs. live weight and 250-270 lbs. live weight, but no significant difference was observed in the results obtained in these two groups, nor was there any significant difference between male and female animals in either group. Our results will, therefore, be quoted for all the animals as one group.

The carcasses were split into left and right sides. One side was completely boned out and all edible meat (i.e. lean and fatty tissue, but not offal) was very finely comminuted and mixed and sampled for analysis. The other side was arbitrarily divided into three parts, namely shoulder, middle and leg. Each of these parts was again boned out, comminuted, mixed and sampled.

For the purpose of the analysis it was assumed that the lean meat content of the sample was given by its weight after deduction of its fat content; due care was taken to avoid significant moisture losses due to evaporation.

The following results were obtained from the analysis of 18 pig carcasses:-

	<u>Nitrogen Content</u>	
Shoulder	3.37%	(Standard error 0.08)
Middle	3.66%	(" " 0.07)
Leg	3.52%	(" " 0.06)
Average for all edible meat	3.45%	(" " 0.075)

It will be seen that especially the figure from the whole meat is considerably lower than 3.6 recommended in 1952 by the Analytical Methods Committee.

The different nitrogen content found in the various parts of the carcass could be due either to a difference in the moisture content or to a different composition of the proteins.

The following figures which give the nitrogen of fat-free dry tissues indicate that the spread in the factors is due to differences in the moisture content of the tissues:-

	<u>Nitrogen Content of dry fat-free tissue</u>	
Shoulder	15.55%	(Standard error 0.50)
Middle	15.75%	(" " 0.46)
Leg	15.56%	(" " 0.46)