

SOME ASPECTS OF THE BONE-MUSCLE
RELATIONSHIPS IN NEW ZEALAND
LAMB AND MUTTON CARCASSES

A Thesis Presented at Massey Agricultural
College in Partial Fulfilment of the
Requirements for the Degree of Master
of Agricultural Science in the
University of New Zealand

by
A.J.F. RUSSEL

General impressions are never to be trusted. Unfortunately when they are of long standing they become fixed rules of life, and assume a prescriptive right never to be questioned. Consequently those who are not accustomed to original inquiry entertain a hatred and a horror of statistics. They cannot endure the idea of submitting their sacred impressions to cold blooded verification. But it is the triumph of scientific men to rise superior to such superstitions, to desire tests by which the value of such beliefs may be ascertained, and to feel sufficiently masters of themselves to discard contemptuously whatever may be found untrue.

Francis Galton.

ACKNOWLEDGEMENTS

It is a pleasure to acknowledge the personal interest shown, and the willing guidance given, by Mr. R.A. Barton and Professor A.L. Rae throughout the course of this study.

The writer would also wish to express his indebtedness to the Sheep Husbandry Department, Massey Agricultural College, for making available to him data and materials from two earlier investigations. Thanks are due to Mr. M.J. Roche for assistance in photographic matters, to Miss M.G. Campbell for the translation of German papers, and to the library staff, Massey Agricultural College, for their help in obtaining references, many from interloan sources. Special acknowledgement is made to Mrs. F. Puckey for typing this thesis.

This study was undertaken while the writer held a Post-Graduate Agricultural Scholarship from the Department of Agriculture for Scotland.

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CHAPTER I

INTRODUCTION

The three main constituents of a meat carcass are bone, muscle, and fat, and of these the lean meat or muscle is of greatest interest and importance to the consumer. Bone represents an almost total waste and is hence considered as undesirable and as something which must be accepted with the desirable muscular tissue. In the words of Robert Bekowell, "You can't eat bone, therefore give the public something to eat." (Pawson, 1957).

The physical properties of muscle and bone are markedly different. Muscular tissue is compressible and hence difficult to measure with accuracy on a linear scale. The intimate association of skeletal muscle with other tissues makes its complete removal for accurate weight estimation both difficult and tedious. Bony tissue, on the other hand, lends itself more readily to the measurement of linear dimensions and weight.

The close physical association of the muscular and bony tissues in the animal body prompts the question as to the possibility of the existence of a similar quantitative relationship between these two tissues. The presence of a strong quantitative relationship between muscle and bone which would allow an accurate prediction of the amount of muscular tissue to be made from a knowledge of the weight and/or linear measurements of one or more bones would be of considerable value to

producers and consumers of meat animals. In this respect the metacarpal and metatarsal or cannon bones are of particular interest as possible indices of the weight of muscular tissue in the carcass, in that these bones are not included in the carcass as the term is generally understood in New Zealand and Great Britain, thus obviating the necessity for any mutilation of the carcass in an attempt to assess the amount of muscular tissue. Although the availability of the cannon bones makes them a first choice in the search for a simple index of muscle, the bones of the carcass, and particularly those of the limbs, are also worthy of consideration as their very inclusion in the carcass suggests that they may be more closely associated in a quantitative sense, with the carcass musculature.

Investigations in the field of bone-muscle relationships have been made at various times by different workers. In the majority of instances the numbers of carcasses studied have been small, and because of this and other reasons the reports in the literature have frequently been conflicting. The present study is based on data from some 150 mutton and lamb carcasses, which, it is felt, provides a sounder basis than any hitherto for investigating the possibilities of using certain simple bone measurements to estimate the amount of muscular tissue in mutton or lamb carcasses.