DEVELOPMENT OF CRITERIA
FOR LAMB CARCASS CERTIFICATION

B. D. VAN STAVERN

THE OHIO STATE UNIVERSITY

There has been increasing emphasis placed upon Meat Animal Improvement in recent years. We are all familiar with many well known facts that attest to this effort; an increased number of research projects designed to improve or to measure meat animal merit, the accompanying number of research workers in this field, the growth in size, number and interest in quality meat contests and/or carcass shows on a national, area, state or county basis -- we could go on -- but each of us is familiar with the "tide of change" that is so dynamic in today's livestock and meat industry.

This "tide" has affected not only the researchers and educators but it has engulfed forward-looking meat animal producers and the leadership of organizations that represent and serve them. They have indicated a desire to improve their product if indeed improvement is in order.

Meat animal producers and the organizations that represent and serve them have turned, in many instances, to the "meat people" of our colleges and universities for assistance in determining or establishing "standards of excellence" to aid them in their improvement efforts. I am sure we have individually or collectively offered the best advice or information available to us. In many cases, however, we have evaluated the information a bit differently resulting in a variety of "standards of excellence" for the same product. How many times have we heard the expression "when you meat men make up your mind what you want then we will produce it"? ?

The title of this presentation "Development of Criteria for Lamb Carcass Certification" needs some amplification. We must assume that the "criteria" developed will be used to evaluate individual lamb carcasses and subsequent "certification" will be made regarding the degree of excellence the carcass attained. If this is true then we must have an "ideal" from which we can measure degree of excellence, in other words, we need standards for each of the criteria we wish to apply. This all sounds rather elementary and perhaps unnecessary at this point -- but wait -- what is the basis for determining excellence in a lamb carcass? Is it the money the producer can make because he produces a lamb carcass efficiently? Is it the pounds of carcass hanging on the rail in relationship to the live lamb? Is it the "keeping" or shipping characteristics of the carcass? Is it the carcass with the greatest retail value? Is it the carcass that produces chops and roasts with the greatest consumer appeal? What is the basis for determining excellence? I expect it depends upon whose point of view is being expressed. This must be considered before we can hope to develop meaningful "criteria".

Dr. G. M. Spurlock of the University of California (1) outlined rather succinctly our challenge, or the scope, of our task when he asked
"what are those characteristics that make a carcass desirable? How can these points be measured? How are they interrelated? Furthermore, how much of the animals development in regard to each characteristic is due to inheritance and how much to environment?" This latter question is especially relevant in terms of breeding programs or "breed certification standards" where carcass characteristics are used to determine sire excellence. Sheep improvement groups, breed organizations, production or progeny testing programs and other industry-wide interests are asking - yes, demanding, some guidelines to carcass merit for use in "improvement" efforts.

The magnitude of the task, its ramifications and my own ineptness dictates that I refrain from proposing yet another set of "criteria for certification". Many such suggestions have been made previously. I shall, rather, present information that may be pertinent and preliminary to such a proposal. A review of the literature would be helpful. For this review I refer you to the report of Carpenter (8) at the 1963 Conference.

Kemp in 1961 (2) proposed to this conference a procedure for quality lamb contests. This procedure along with its standards was adopted as set of guidelines to lamb carcass appraisal. The essence of this procedure was to evaluate lamb carcasses according to cutability based on (1) relative proportion of parts (conformation) (2) area of loin eye (3) fat thickness and (4) kidney and pelvic fat, and on quality based on (1) firmness of lean and fat (2) color of lean and fat (3) marbling and (4) color and porosity of bone. The system has been tested under "show" conditions and every indication is that it tends to group carcasses of similar characteristics. One major concern, in certification work however, is that it is highly subjective and compensatory factors are difficult to rationalize.

Hoke in 1961 (3) presented the results of a USDA study indicating that the legs and sirloin represent 35-36 percent of the value of a lamb carcass; the legs, sirloin, loin and rib (rack) about 65-67 percent of the legs, sirloin, loin, rib and square-cut shoulder about 88-90 percent. He further offered a linear regression equation for predicting the retail yield of these major cuts from some easily obtained measurements. The measurements required are: conformation grade, fat thickness and percent kidney fat. The standard error for this equation was 1.42 percent.

Zinn (4) in reviewing some of the work of the Western Regional Project W-61 described a cutting procedure that removed the effect of fatness on the percentage of cuts and thus gave a more accurate estimate of the quantity of saleable meat. This work also served to remind us of breed and sex influences that may affect carcass characteristics.

Brannon and others (5) conducted studies relating "on foot" and "carcass" measurements. These workers established percent trimmed hind saddle as the criteria for a meaty lamb and used this criteria in exploring carcass characteristics that could be used to predict it. Five measures were incorporated into a formula. They are: Carcass weight, fat thickness, loin width, gigot width and loin length. The correlation between the predicted and determined percentage trimmed hind saddle was 0.788.

Judge and Martin (6) reported that percent edible portion in a lamb carcass could be predicted from an equation using chilled carcass
weight, fat thickness and kidney fat. The formula gave a correlation coefficient of 0.77 with percent edible portion. It is interesting to note that the addition of other measurements of muscling did not improve this significantly.

Fields, et al (7) developed a formula for predicting the percent lean in a carcass using the easily obtainable measures of area of loin eye/45# carcass, fat thickness, percent kidney and kidney fat and percent leg. This formula showed a correlation of 0.75 with percent lean in the carcass.

Dr. Spurlock (1) compared several systems of carcass evaluation including the RMC by Kemp, the Kentucky by Fields, the USDA by Hoke, the Purdue by Judge and others. His work indicates that the Kentucky, USDA and Purdue formulas are nearly equal in predicting trimmed retail cuts and in putting emphasis against carcass fat content.

As I reviewed the above reports and many others not specifically cited, I was reminded of the many similarities and yet the tremendous differences that exist in "requirements for excellence"; in carcass shows, in progeny testing programs, in individual states sheep improvement committees specifications, in breed association programs and most recently in the "consumer-preferred" lamb described by the industry-wide lamb committee of the American Sheep Producers Council. This reflection caused us to wonder just how all these efforts might be pulled together to really come up with "certification criteria" acceptable to all and truly reflect the concerns of the total sheep and lamb industry. As a result I have listed some "criteria" for criteria:

1. In-plant-feasibility- It seems especially important that information required for carcass evaluation lends itself readily to packing plant procedures. At present, this limits the amount of knife work we should expect. This consideration may not be too technical, but it could represent the success or failure of our efforts. Such prediction factors as kidney fat, carcass weight and conformation score may deserve considerable attention. Loin eye size and fat thickness may also be realistic. Other factors such as percentage of specific cuts or combination of cuts may be highly desirable but may not pass the "feasibility" test.

2. Objectivity- It goes without saying that, in terms of in-plant feasibility, we cannot be completely objective. It is also obvious that standard units of objective measures have communication, application, and duplication possibilities not associated with subjective measurements. Many states have completed or are presently doing "objective" studies in lamb carcass evaluation. Their results can help us in developing objective criteria.

3. Consider efficiency of production- This is paramount to producer interest. While it may not always apply in terms of carcass evaluation alone its significance cannot be ignored in progeny testing or improvement work. Many current suggestions have included this consideration. For example: The Hampshire Breed Program specifies 50 pounds of chilled carcass in 120 days. In some of our Ohio work we have looked at chilled carcass per day of age, some California work expresses this as trimmed cuts
per day of age, loin eye area per day of age, etc. Scattered around the country there is information pertinent to this criteria. It needs to be pulled together, considered and some decisions made as to its application in certification work.

4. Recognition of breed, sex, type of birth, age of ewes and environmental effects- This consideration may well be classed with efficiency of production. It may have little direct effect upon the evaluation of a carcass but in terms of progeny evaluation for improvement these effects must be recognized. Western regional W-61 and some recent Kentucky work, among others, sheds some light upon these effects. Perhaps more work is needed. I am apprehensive about standards that dictate a type or breed of sheep to the exclusion of others. Perhaps this apprehension is unwarranted.

5. Standards that are realistic- They must present a challenge yet they must be reasonably attainable. "Nothing breeds success like success". Standards and Goals are different. I have studied the results of many carcass shows and cutting tests that you folks have shared with me. There have been many desirable lambs represented by these data. Accordingly, I believe some proposals for excellence currently being offered may be just a little out of reach.

6. Marketability of product- This area of concern could consider such things as optimum carcass weight, minimum fat covering and things of this nature. We are aware of questions that perhaps have not been answered too conclusively in this regard.

7. Consumer Acceptability- Super imposed over all the improvement efforts there must be a recognition of consumer acceptability. I am sure "quality" characteristics are significant in this regard.

These areas of concern might well form the basis for the "Development of Criteria for Lamb Carcass Certification". Much information is known, perhaps there are specific problems that will require additional research. I would be remiss if I did not include an additional "criteria" in my list. Flexibility --subject to change as research and progress dictates.

In conclusion, there are presently many different procedures and "criteria" for lamb carcass evaluation. Undoubtedly these "criteria" are founded upon sound research and serve a useful and meaningful purpose for the people using them. Industry concern seems to be in arriving at specific measures and standards that will have National significance. Many organizations and groups are active in this endeavor.

Perhaps the Reciprocal Meat Conference can initiate with the American Society of Animal Science, Agricultural Research Service, representative of breed associations, and others a committee to bring together all the pertinent information available and "work-out" a plan with appropriate standards for lamb certification work.
REFERENCES


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Dr. Carpenter: Thank you, Bob, for that excellent presentation. At the 16th Reciprocal Meat Conference you that were present recall that the Conference charged our Beef Committee to develop a uniform method for reporting beef carcass information to all interested individuals. I believe that one of the people who discussed this at last year's Conference happened to be the one as usual that we saddled with this responsibility. So to present the topic "The Development of Uniform Methods for Beef Carcass Evaluation", I present to you Carroll Schoonover from the University of Wyoming.