WHERE DO WE GO FROM HERE?*

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One unfamiliar with the production of domestic livestock might ask of us, "Why all this concern in the study of meat animal growth and development?" After all, the genetic and environmental factors dictate the rate and composition of growth. Why should the meat scientist become so concerned in this natural phenomenon? Some would say we should concern ourselves with the technical aspects of processing and marketing the product provided us by the livestock producer regardless of shape, size or composition.

Yet concerned we have been. In reviewing the past ten Reciprocal Meat Conference Proceedings I have observed no less than 20 papers addressed to some aspect of growth and development. In introducing the 1967 program for this committee, I challenged the conferees as follows:

> The study of the anatomical composition of meat animals and the physiology of growth and fattening, which to a large extent determines this composition, is one of the most important and certainly the most neglected aspects of the science of animal production. I am convinced that we tend to think too much in terms of the weight of meat produced and too little in terms of anatomical units of the carcass as individual muscles, bones, and fat deposits, and the composition of this weight in terms of protein and fat. We are like the man who can visualize the form of a completed house, but has no fundamental knowledge of how to arrange the building blocks to achieve this final form. Like him, we animal scientists can visualize the "ideal" type for final form and composition of the animal we wish to produce. But we lack the ability to alter to any great extent this final form by genetics, nutrition, and management because of our lack of knowledge concerning the interrelationship of our building stones.

Refereed scientific publications since 1967 indicate this challenge has been accepted, and much progress has been made in the development of an understanding of the "building blocks." However, our tasks as animal and meat scientists may be even more of a challenge today than in 1967. As pointed out by Baker (1973), "Today in beef production in the U.S. nearly 50 breeds of cattle are in use compared to less than

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20 breeds a few years ago. Within some of the herds in the U.S., individual cows can be found that have a mature weight of 2000 lbs. or more while in other herds some individuals weigh as little as 700 lbs. Crossbreeding in commercial beef production has changed from an accident to planned action." What a challenge this is to find the correct combination of this vast array of genetic material that will provide a more efficient production unit. Couple this variable genetic base with a variable geographic-environmental management factor--the interaction is almost overwhelming.

There is a theory that man will not be able to afford to eat meat by the year 2000. Witness a national wire service release on June 4, 1974:

> The beef steer has been attacked as an inefficient wastrel which squanders food resources needed by hungry millions abroad...Critics, including economist Barbara Ward and others concerned with potential threats of world food shortages in the future, have made an increasing point recently of noting that the beef eating countries consume a disproportionately large part of the world grain supply...Economist Lester R. Brown, in a recent article, noted that the average American consumes enough grain each year to keep nearly 5 Indians, Nigerians or residents of Columbia alive.

This theory proceeds that the yield in energy from animal products is only 10 to 30% as much as energy fed. They devour more protein in the form of plant food than they can produce in the form of meat. The world's total protein supply is thus diminished. Eventually, man will find it necessary to get all of his protein directly from plants without interference from that "wasteful intermediary," the meat animal.

The animal agriculturalists reaction to this theory has historically been and still is: This theory holds up only if the entire diet of the animal is composed of foods eaten by people. Over 60% of the world's agricultural land is nonarable and suited only for grazing. Animals are the only practical means of utilizing the resources of human food production. However, in this day of a reactionary press and reactionary-revolutionary people, this counteraction of the theory is inadequate. Already, there is a great temptation to put these marginal nonarable lands into crop production. If they are forced into crop production, the losses in soil fertility and productivity could be disastrous to the needs of future generations. We as animal and meat scientists are charged with the responsibility of identifying problems and establishing priorities in solving these afore mentioned problems. We must develop appropriate knowledge, adapt knowledge already available to fit the greatest needs, and see that the knowledge is widely extended and applied.

Each of us recognizes that growth and development is the productive process of meat animals. We are also aware that these animals exhibit remarkable versatility as physiological machines. The flexibility of animals as transformers of feed into usable products is indicated by:

Variations in size,
Variations in environmental adaptation,
Variations in ability to utilize feeds,
Variations in genetic base, and
Variations in products.

It seems to me that our challenge as animal and meat scientists is that of improving the already productive and highly flexible physiological machine. The accomplishment of this task will require:

1. The establishment of a high priority in finance and personnel toward a research effort to develop a basic understanding of this physiological machine from the cellular to the composite level.

2. The coordination of efforts between the geneticist, the nutritionist and the meat scientist in developing research studies to achieve the goal of a more efficient productive animal unit.

3. The adaptation of the basic knowledge obtained to commercial production units. This implies that our responsibility includes that of extension and dissemination of applied knowledge.

4. To mobilize resources for problem solving, to create in various educational institutions appropriate groups of courses in the broad spectrum of interrelated disciplines of the field to develop competence in our trained personnel.

5. It appears to me that we who have such a great interest in the end product of meat animal production must provide the leadership and direction towards the production of a more efficient and profitable animal industry.

The greatest challenge to us, first as citizens of a changing civilization, secondly as animal and meat scientists, is to promote the long-term welfare of our fellow humans, and to make the contribution of animal production to that end as efficient as it can be. If we are to meet this challenge we must learn to work with other specialists--the geneticists, nutritionists, economists, technologists, and social scientists. We must be aware of the need to fit animal production units where they will provide the most effective use of resources to meet real needs for foods, or other products, and to develop a physiological machine which can convert efficiently marginal protein and energy sources into a highly nutritious and digestible human food.