Chapter 3

Perspectives of Cell Wall Biodegradation—Session Synopsis

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The importance of utilization of plant cell walls by ruminants for production of milk, meat, hides, and wool as well as for animal labor world wide cannot be overestimated. Production and financial statistics for the USA indicate the magnitude of resources and the economic investment involved in animal production (USDA, 1990). Statistics compiled in 1989 indicated that hay production was 145 million tons with a value of more than $11 billion. Preliminary figures for feed consumed, based on corn equivalent feeding value, for livestock and poultry in 1988 were 72 million tons for harvested roughage and 187 million tons for pastures. The economic value of cattle for 1990 was listed as more than $63 billion.

Variations in feed quality can have a significant impact on production economics. Improved feed quality improves animal performance and production. For example, studies with bermudagrass hybrids [Cynodon dactylon (L.) Pers.] indicated that a 12% increase in digestibility resulted in a 30% mean weight gain and about 25% less feed per pound of gain in dairy cows (Lowrey et al., 1968). At least part of the reason for improvement in digestibility appeared to be due to more bioavailable plant cell walls (Akin et al., 1990a). While the amount of animal production required may vary at times and in different regions, improved efficiency resulting in reduced costs is always important to the economy of producers.

Research related to understanding and improving the animal, plant, and microbial components of ruminant production systems, and the complex interactions among these components, has resulted in significant benefits. Despite the quality and quantity of research, much remains to be learned and applied in improving the utilization of plant cell walls for ruminant production. The variety of forage-livestock systems presently used, as well as the various responses by supplements such as protein and energy to fiber diets (see chapter 2 by Galyean and Goetsch in this book), indicates the need for additional information. A requirement for more research on plant cell walls is supported by the following quote from the National Research Council...