

year, 2-year-old heifers calving in February and weaning age of 205 days, the daily dry matter intake and TDN requirements of a first calf heifer can be predicted (Table 1). However, dry matter intake is only part of a cow-calf system. Reproduction performance of the cow and bull, economic considerations, breed differences and growth of the calf are some additional factors needed to describe a cow-calf system.

At this time, mathematical relationships describing forage intake of calves from birth to weaning, weight gain of dry non-pregnant cows and breed effects are being developed to improve the prediction of the inputs and outputs of a cow-calf system. The final goal of this project is to use the developed mathematical relationships to predict the inputs and outputs of alternative management schemes.

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## Functional Properties of Bovine Hide Collagen in Coarse Ground Beef Sausage

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With the continuing development of the Third World nations, a need for labor-intensive industries to be utilized by them has led to shoe and leather manufacturing industries being established within their respective borders. This in turn has resulted in the decline of shoe and leather industries in the United States. To help combat this trend, new leather tanning processes have been developed, and ways of using surplus hides and hide trims are being explored. The excess hides and their trim contain food grade collagen, which is a valuable protein source. It is of great importance to find an economical and suitable outlet for this product. Food-grade hide collagen is manufactured from the flesh split of the hide, which is also used to make suede leather. The protein attained from the bovine hide collagen is not a complete protein; it lacks the essential amino acid methionine and is low in tryptophan. Therefore, the collagen should be used in conjunction with a complete protein. The experiment is nearing completion, and after computer analysis of the data, conclusions concerning the functional properties of the bovine hide collagen will be made.

"Cold" boned meat from a market cutter/canner grade cow was utilized. The meat was then ground through a half-inch plate and mixed in a 100-lb sausage mixer for 2 minutes. It was then divided into 10-lb units and double-wrapped in freezer paper and stored in a -16°F freezer. The 10-lb units were then randomly assigned differing levels of bovine hide collagen (0-10-20-30 percent). The units were mixed with the collagen and spices. The sausage mixture was then stored for 22 hours at 34°F. The sausage was then removed and stuffed into 2½-inch fibrous casings and cooked for 4 hours until an internal temperature of 155°F was attained, using a Blodgett convection oven. The sausages were removed from the oven and placed in a 40°F ice bath for 1 hour. After this cooling period they were removed, dried, and placed in a 34°F cooler for 16 hours.

Samples were randomly obtained at various stages in the process and subjected to a variety of tests. Of interest were volume change, shrinkage, fat, moisture, free water, texture, color, total nitrogen, and hydroxyproline content.

There was no significant difference in shrink ( $P > .1$ ) between bologna containing 0 percent and 10 percent collagen levels.

**Table 1: Mean shrink values for 0 and 10 percent collagen levels.**

0%	10%	Std. deviation of treatment means (%)
7.19	7.59	0.84

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## The Effect of Exposure of Heifer Calves to *Staphylococcus aureus* on the Incidence of Mastitis at First Calving

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Newborn Holstein, Ayrshire and Jersey heifer calves from dams free of Staphylococcal udder infections were divided into two treatment groups. One group was fed a *Staph. aureus* culture (Newbold Strain #305) in milk twice a week for a total of nine feedings, and the other group served as controls. Quarter milk samples collected within the first few days after first calving were cultured on blood agar for enumeration of mastitis-causing organisms. The incidence of Staphylococcal udder infection present in the treated group at the beginning of the first lactation was compared with that in the untreated control group.

The experiment was replicated by using calves born in the OSU herd on two successive years. The first replication of heifer calves consisted of 21 treated and 21 controls. Death loss and culling reduced the numbers to 16 in each group. Of these, 21 were bred to calve during the summer when they were about 2 years of age. The 11 remaining younger calves, consisting of five treated and six controls, were bred to calve during the following summer at around 2½ years of age. No Staphylococcal infections