



Western Beef Resource Committee

Cattle Producer's Library

Reproduction Section

CL402

Overview of Fetal Development

Revised by

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Once the beef cow is bred, we are growing a calf in addition to maintaining the cow. The purpose of this section is to discuss the growth and nutritional demands of the unborn calf during gestation, with special emphasis on the last trimester.

Growth, an economic function of beef production, is fulfilled when nutritional intake is greater than the maintenance requirement of the animal. Cattle producers are generally concerned with the growth cycle, which has direct economic implications in their particular operation as pounds sold as weaning or yearling weight.

Growth starts with the fertilization of a female's egg by a male's sperm. During the next 282 days, the bovine calf is hidden beneath hide, muscle, skeleton, and a series of protective fetal membranes. Growth of the fetus during this time can neither be observed nor measured.

During the first 45 days after fertilization, the single cell embryo multiplies and differentiates into the various body parts: nervous system, internal organs, skeleton, and muscles. Extremely small but fully formed, the fetal calf is then ready to grow, slowly at first, but quite rapidly during the last third of gestation.

Rate of fetal growth depends primarily on nutrient supply and the ability of the fetus to use those nutrients. Breed and strain differences in fetal size are due to differences in the rate of cell division, which is deter-

mined genetically. There is a close integration between the nutrient supply to the fetus (environmental factor), and rate of cell division (genetic factor), and hence rate of growth. Other environmental factors that affect fetal growth include size and age of the dam.

The fetus will weigh from 20 to 25 pounds at the end of the second trimester when it is approximately 190 days of age. The nutritional requirements of the calf to this point have been relatively small. During the last trimester, however, nutritional requirements of the calf increase rapidly, paralleling the rapid growth of the calf as it approaches parturition. Its weight will increase from 20 to 25 pounds to 70, 80, or more pounds at birth. Fetal membrane weight will also increase. A living and growing organism, the fetal calf must have adequate nutrients to reach normal birth weight. Remember that all nutrients must come from the dam.

We are not just maintaining a cow; we are also growing a calf.

Points to Ponder

1. Cattle producers sell growth (pounds of beef).
2. Growth starts with fertilization.
3. *In utero* calf growth accelerates during the last trimester.
4. Nutritional requirements increase in proportion to growth rate.
5. We are not just maintaining a cow; we are also growing a calf.

¹Original authors were C. O. Schoonover and David Yates, retired and former University of Wyoming specialists, respectively.



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