

## **EFFECTS OF BY-PASS PROTEIN SUPPLEMENTATION ON POSTPARTUM ANESTRUS INTERVALS IN RANGE BEEF COWS**

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(Key Words: Reproduction, By-pass Protein, Insulin, Postpartum Anestrus)

Previous research has demonstrated that by-pass protein fed to early postpartum (PP) cows and heifers reduces PP intervals and increases conception rates. Additionally, by-pass proteins have been shown to elevate serum concentrations of insulin, which is a key metabolic hormone. In this experiment 21 mature cows (avg 28 days PP) were randomly assigned to receive by-pass protein supplement and/or exogenous insulin. Ten days after initiation of treatments a intensive bleeding period (every 15 min for 6 hr) was conducted to determine luteinizing hormone (LH), follicle stimulating hormone (FSH), and insulin concentrations. A GnRH challenge (.22  $\mu$ g/kg body weight) was administered at this time to release pituitary stores of LH and FSH. LH and FSH are necessary for initiation of estrous cycles in cattle. Although final analysis is not complete there appears to be significantly higher concentrations of LH and FSH in those cows receiving by-pass protein supplement.

## **IMPROVING REPRODUCTIVE EFFICIENCY IN SHEEP**

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One of the main problems that the US sheep industry faces each year is that related to loss of potential lambs during early pregnancy. In fact, losses between conception and embryonic implantation have been defined as major failures which negatively impact ewe reproductive performance (Parr et al., 1988). The nutritional status of the ewe during the breeding season as well as the relationship with hormones that trigger onset of estrus and those which influence embryonic implantation, are pivotal components in determining the efficiency of the productive process (Edey, 1976; Diskin and Niswender, 1989; Rhind et al., 1989). However, the underlying mechanisms by which nutrition regulates those key components of the ewe's reproductive process, are not clearly understood. Therefore, two experiments will be conducted to better understand the relationship among nutritional status, hormonal profile, ovulation rate and embryo mortality. In the first trial, we speculate that undegradable protein supplemented during both pre-mating season and pre-implantation period will promote increased reproductive efficiency of Rambouillet ewes under range conditions. In the second experiment, we propose that exogenous insulin and undegradable protein will improve the ewe's nutritional status, enhancing both ovulation rate and embryonic implantation of two sheep genotypes (Rambouillet and Suffolk) fed a low quality forage diet.

The first experiment is being conducted at the New Mexico Range and Livestock Research Center at Corona, NM. Two hundred sixty ewes will be used in this study divided into six pastures. The diets evaluated are a non-supplemented control, 25.5% CP and 42.6% CP. The degradable protein are the same in the two supplements with the 42.6% CP diet containing additional protein in the form of nondegradable protein. Diets will be fed for 21 days pre-breeding and 17 days after rams were introduced. Supplemental levels are .33 and .25 pounds daily for the low and high protein supplements. Ovulation rates, pregnancy rate and fetal numbers will be determined.

The second study will be conducted on the New Mexico State University sheep farm. Suffolk and Rambouillet ewes will be used. The protein supplement investigated will be the high protein from Experiment 1. Also, insulin (12 IU Lente) will be the third factor in a 2 x 2 x 2 factorial arrangement of a completely random design. During the experimental period which will include 21 days before breeding and 21 days after joining with the rams. Ovulation rates, embryonic mortality and endocrine function will be evaluated.