

**Effects of Liquid Supplement With or Without Fat Fed to Cows  
Consuming Native Range on Body Weight, Body condition  
Score and Calf Performance**

***Executive Summary Submitted to:***

***AFIA Liquid Feed Committee/Research Subcommittee***

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**BACKGROUND:** Previous research conducted at New Mexico State University (Appeddu et al. 1995) had suggested that the addition of fat to a typical protein supplement fed to young range beef cows:

- Increased milk production
- Extended postpartum anestrus period
- Increased weaning weights 30 pounds per calf

A follow up study (Serratos-Corona et al. 1997) conducted in July supplied fat in liquid supplement to aged beef cows. These cows were relocated from the Corona Range and Livestock Research Center to NMSU Campus Livestock Research Center. These cows were fed dormant dry forage imitating dry summer conditions. They were also fed one of two supplements, a typical liquid supplied with urea or a second supplement fortified with urea and tallow. The objective of the study was to determine the effects on milk production. The study found that the cows fed the addition fat:

- Increased milk production 2 pounds per cow per day

These two studies led to the hypothesis that fat could be added to supplements fed to cows four years old and older to increase weaning weights. This type of a program would be most effective for ranchers that sold calves at weaning. Idea being that fat added to a liquid supplement would enhance early milk production, which would have a positive effect on weaning weights while having little or no effect on reproduction. While this type of supplement may increase milk production in young cows, but may also extend the anestrus period.

**APPROACH:** First study was conducted in the late winter and spring 1998-1999. Mostly angus (with a little simmental and hereford) cows were adapted to Regulate Feeders (consumption controlled feeders Agri Beef Co., Nampa, ID) prior to calving. These cows had a body condition score of 3.7 in February. Cows in separate pastures were given access to salt and mineral only (S+M), salt and mineral plus liquid supplement fortified with urea (30% CP) (L+U) and salt plus mineral plus liquid supplement with urea and tallow (L+U+T). The cows grazed pinon juniper type rangeland with blue grama occurring in the highest frequency. Milk production, cow body condition score, cow body weight change, calf weights were measured.

- Milk production
  - Cows fed S+M or L+U produced  $12 \pm 1$  lb milk per day
  - Cows fed L+U+T produced  $13.7 \pm 1$  lb milk per day
- Weaning weights (231 day)
  - Calves from cows fed S+M weighed  $475 \pm 10$  pounds
  - Calves from cows fed L+U weighed  $496 \pm 10$  pounds
  - Calves from cows fed L+U+T weighed  $515 \pm 10$  pounds
- Body condition score and body weight change
  - Score changed + .38 (S+M), .48 (L+U) and .37 (L+U+T)  $\pm .12$
  - Weight changed - 83 (S+M), - 19 (L+U) and -51 (L+U+T)  $\pm 15$  lb

Second study was conducted in late winter and spring 1998-1999 with 121 cows ( $1079 \pm 9.2$  lbs.). Treatments were the same as the previous year. Six pastures were used. Cows were supplemented for 99 days. These cows had a body condition score of 4.5 in February.

- Milk production
  - Cows fed S+M or L+U produced 12 or  $14 \pm 1.8$  lb milk per day
  - Cows fed L+U+T produced  $14.4 \pm 1.8$  lb milk per day
- Branding weights
  - Calves from cows fed S+M weighed  $159 \pm 10$  pounds
  - Calves from cows fed L+U weighed  $167 \pm 10$  pounds
  - Calves from cows fed L+U+T weighed  $178 \pm 10$  pounds
- Body condition score and body weight change at branding
  - Score changed -.73 (S+M), -.74 (L+U) and -.25 (L+U+T)  $\pm .23$
  - Weight changed -199 (S+M), - 160 (L+U) and -125 (L+U+T)  $\pm 24$  lb

**SUMMARY:** In both years milk production and calf weights were improved with fat fortification. The data is strong numerically but is not quite statistically significant. We recommend that funding continue to strengthen the implications of the results.

**PROPOSAL IN BRIEF:** WE suggest a repetition of the 1998 to 1999 study with a few modifications. The cows will be 4 years old and older and will graze 6 pastures. Two replications per treatment with the treatments the same as 98/99 study. Cows will have access to supplement 2 weeks prior to the predicted date of the birth of the first calf. Supplement will be available at least through the breeding season and if forage and cow conditions suggest supplementation will continue until conditions improve. The Regulate Feeders will restrict intake of supplement. Measurements to be collected include:

- Cow and calf body weight change
- Cow body condition score change
- Liquid supplement intake
- Nutrient analysis of diet samples
- Blood metabolite profile prior to breeding

**EXPECTED RESULTS:** A continuation of this study should demonstrate that the liquid supplement plus urea reduces post partum weight loss after calving and improves calf weaning weight compared to cows fed no supplement. Finally, cows fed liquid supplement plus fat will wean heavier calves.

### BUDGET

Item	Description	Cost (\$)	Contributor
140 cow calf pairs	experimental animals	126,000	Corona Ranch
cannulated cows	4 diet samplers	8,000	Corona Ranch
Grazing costs	grazed pasture value	5,600	Corona Ranch
Vaccinations	cow/calf health	8,000	Corona Ranch
Salt and mineral	cow/calf nutrition	750	Corona Ranch
Travel	20 trips at \$125/ trip	2,500	Liquid Feed Com
Labor	Student labor \$8.00/hr @ 720 hr	6000	Liquid Feed Com
Blood collection	Tubes, needles etc. \$2/cow	280	Liquid Feed Com
Blood profile	Metabolites \$25/cow	3500	Liquid Feed Com
Cr oxide boluses	diet intake	2500	Liquid Feed Com
Dietary nutrients	24 diet samples	480	Liquid Feed Com
Cr oxide analysis	200 samples	400	Liquid Feed Com
Supplement	140 cows for 140 days/2lb @ \$.15	5880	Liquid Feed Com
Equipment maintenance	laboratory equipment	600	Liquid Feed Com

Grand total	164,490
Corona ranch contribution	148,350
Liquid Feed Committee contribution	16,140

\$ 8070 x 2 payments