

# Livestock Efficiency

## Low versus High Input Development of Replacement Heifers

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Heifer development strategies have typically depended upon high inputs (feed) and are costly. Previous research at the Corona Range and Livestock Research Center demonstrated that heifers could be developed on rangelands with limited supplemental feed. In our studies comparing a typical cottonseed cake supplement to rumen undegradable protein (also known as bypass protein), the rumen undegradable protein has consistently resulted in the greatest pregnancy rates (Tables 1 and 2). These studies also demonstrated that in replacement heifers weaned in October, supplementation could be delayed until February and heifers could be bred at body weights below 65% of their mature weights.

Based on these initial studies, our current research was designed to answer the question **“Does the type of heifer development program (low input ranch developed vs high input feedlot developed) influence longevity of the cow herd?”** Specifically, are heifers raised in the environment they are expected to perform in at an advantage or disadvantage compared to heifers developed in a feedlot when they move into the cow herd.

**Objectives:** Determine pregnancy rates and longevity in heifers developed under low input or high input programs.

**Expected Outcomes:** Pregnancy rates in heifers developed in the feedlot may be higher than heifers developed on the ranch, however, we expect the culling rate of non-pregnant 2 and 3 year old cows to be greater in the feedlot developed heifers.

**Duration-**2003-2011

**Approach:** Approximately 66 heifers weaned each October will be randomly allotted to one of three treatments. Treatments will consist of two low input (cottonseed control and NMSU bypass) or high input (feedlot) development programs. Heifers will receive minimal supplemental feed (0.5 lbs per head/day) from October weaning until mid January. Beginning mid January heifers will receive 2 lbs per head/day of a traditional cottonseed cake supplement (control;n=22 and feedlot heifers; n=22) while the NMSU rumen undegradable supplement will be fed to the remaining 22 head (Table 1). In early February, 22 head of high input heifers, will be shipped to the NMSU Las Cruces Campus for a 90 day feeding period. The remaining 44 head will remain at Corona and continue to receive either the cottonseed cake or rumen undegradable supplement until breeding in mid May. All heifers will be synchronized in early May and the feedlot

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heifers will return to the Corona ranch. Heifers will be artificially inseminated mid-May and exposed to bulls for 45 days. Semen and bulls are chosen for low birth weight. Body weights and hip height will be recorded beginning in January and continuing until September. Pregnancy rates will be determined in September each year. Non-pregnant heifers will be sold and pregnant heifers will move into 2 and 3 year cow studies. Longevity will be determined by the number of heifers pregnant each fall and date of calving.

**Results:** The data for pregnancy rates and body weights as heifers is shown in Table 3. Ranch raised heifers had greater numbers pregnant at a lighter body weight than feedlot heifers. Feedlot heifers weighed more at breeding, however, at palpation for pregnancy in September body weights were similar between ranch raised and feedlot heifers.

Table 1. Supplement Composition

Bypass 36% Crude Protein		Control 36% Crude Protein	
Cottonseed meal	33%	Cottonseed meal	42%
Feathermeal	17%	Soybean meal	30%
Molasses	11%	Molasses	11%
Ground milo	24%	Ground milo	9%

Table 2. Cumulative body weights and pregnancy rates.

	Bypass (122 head)	Control (117 head)
October (weaning)	510 lbs	515 lbs
January	512 lbs	519 lbs
March	543 lbs	547 lbs
May (breeding)	565 lbs	573 lbs
Pregnancy Rate	80%	66%

Table 3. Body weight and pregnancy rates.

	Bypass	Control	Feedlot
November	541 lbs	542 lbs	543 lbs
January (start suppl.)	578 lbs	568 lbs	578 lbs
February	563 lbs	555 lbs	557 lbs
March	585 lbs	576 lbs	636 lbs
April	601 lbs	583 lbs	689 lbs
May (breeding)	639 lbs	645 lbs	735 lbs
July	742 lbs	741 lbs	787 lbs
September	941 lbs	946 lbs	970 lbs
Pregnancy Rate	100%	86%	82%