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;title;Production of 300-day old slaughter-weight calves, yearly energy budgets.  
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;text;The objective of the study was to develop an efficient cow-calf production system matched to improved, irrigated pastures for producers faced with curtailments of grazing on public lands. Thirty-two high-producing beef cows (614 Kg) of mixed breeding were used. Sixteen were mated to bulls proven to pass exceptional growth capability to their offspring using artificial insemination (RGC). The other sixteen cows were naturally mated to bulls shown to pass average growth capability to offspring (AGC). Resultant cow-calf pairs grazed adjacent irrigated pastures of mixed orchard and brome grass (May 15-October 31). Calves were offered a cereal-grain based creep feed on a free-choice basis starting at about 100 days of age (June 15). Creep feed consumption was monitored daily. Pasture forage harvested by the pairs was estimated each 30 days using a strip grazing-clipping method. After weaning (October 31) calves were penned by sire and fed a finisher diet until reaching slaughter weight. Intake was monitored daily. After calves were weaned cows grazed hay-crop aftermath for approximately 30 days. Intake was estimated using the strip-grazing clipping method. Cows were then placed on ammoniated straw-based diets (December 1-May 15). Intake was monitored daily. Total metabolizable energy (ME) consumed by cow and calf by the time calves reached slaughter weight was reduced by 13% (15602 versus 17658 Mcal) with the RGC mainly since those calves reaching slaughter weight 93 days earlier than AGC (309 versus 402 days,  $P < .0001$ ). Although AGC produced heavier carcasses (319 versus 307 Kg,  $P < .0001$ ), RGC produced higher yielding carcasses (USDA yield grade 2.3 versus 3.2,  $P < .0001$ ) such that boneless, closely trimmed retail cut yield was similar. The system using RGC produced 10.2 g of retail cut/Mcal ME used by cow and calf, while the AGC system produced only 8.9 g.