

Effect of a nutritionally-directed, compensatory growth regimen on growth potential and lactational performance of beef heifers

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A nutritionally-regulated and time-dependent compensatory growth regimen during hormone-sensitive growth phase prior to first parturition can affect mammary development and subsequent lactational performance. The objective of this study was to determine the effect on growth performance and lactation potential of beef heifers. Ninety-six beef heifers (285^{2/3} 17.8 kg; 6.2^{2/3} .38 body condition score [BCS]; approximately 305 d of age) were blocked by weight and assigned to either a control (CON) or stair-step compensatory nutrition (SSCN) regimen. Heifers assigned to CON were fed a diet balanced to meet the nutrient requirements of heifers gaining .68 kg/d for 20 wk. Heifers assigned to SSCN were fed an energy restricted diet for 10 wk. Metabolizable energy concentration (ME) of the energy restricted diet was similar to CON, however dry matter intake restricted to 60% of CONT. Protein concentration (CP) was increased in the restricted diet to allow similar daily intakes between dietary treatments. Following the restricted phase, SSCN heifers were given ad libitum access to a high energy diet (130% ME and 100% CP of CON) for 10 wk. Subsequently, all heifers were managed as CON through breeding. Average daily gain (ADG,; .56 vs .07 kg/d; P=.04), BCS (6.0 vs 5.2; P=.03) and growth efficiency (GE, gain*100/feed; 8.4 vs 1.7; P=.08) were reduced during the energy restricted phase of the SSCN regime. Conversely, ADG (.84 vs 1.57 kg/d; P=.01), BCS (6.2 vs 6.7; P=.03) and GE (11.4 vs 17.4; P=.01) were improved by SSCN during the high energy phase. Dry matter intake (DMI; 7.4 kg vs 9.1 kg/d) was increased by SSCN during the later phase. Over the entire feeding period, ADG (.70 vs .82 kg/d; P=.16) and DMI (7.1 vs 6.7 kg/d; P=.14) were not affected by dietary regime. However, GE (10.0 vs 12.0; P=.07) and total heifers conceiving during the breeding season (75.0 vs 89.6%; P<.1) were improved by the experimental regimen. These results indicate that beef heifers raised on a stair-step nutrition and feeding regimen during puberty had improved growth performance.

