Effects of dam prepartum supplement level on performance and reproduction of heifer progeny

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ABSTRACT

Objectives were to determine the effect of dam prepartum supplement level on growth performance, feed efficiency and reproductive performance of female progeny (127 heifers in year 1, 138 heifers in year 2). Mature, multiparous, fall-calving, Angus × Simmental cows (initial age = 5.6 ± 1.9 years, BW = 623 ± 70 kg, BCS = 5.7 ± 0.7) were used in a completely randomised design that included three supplement levels: no supplement (NS), low supplement, 2.16 kg/1 cow/1 d (LS), or high supplement, 8.61 kg/1 cow/1 d (HS). Cows grazed endophyte-infected tall fescue/red clover pastures and were bunk-fed supplement (70% dried distiller's grains plus solubles [DDGS] and 30% soybean hulls) 103 ± 11 d prepartum to 2 ± 11 d postpartum. Dam prepartum supplementation did not affect (p > .60) heifer progeny BW at weaning, breeding, nor at pregnancy verification. Dam prepartum supplementation did not affect (p > .18) heifer progeny AI conception rate, overall pregnancy rate, nor calving rate. Calving date, calf birth BW, percentage of unassisted births, milk production and calf BW at 73 ± 16 d of age were not different (p > .24) among heifer progeny, regardless of dam supplement level. In conclusion, these data suggest within a fall-calving, fescue-based production system, supplementing dams with 2.16 or 8.61 kg/1 cow/1 d of a DDGS-based supplement does not affect growth performance and reproductive performance of subsequent female progeny.

Introduction

The concept of foetal programming was recognised by David J. Barker who suggested the foetal environment influences subsequent adult health (Barker 1990). In beef cattle, the foetal environment has also been shown to influence muscle fibre size, muscle fibre growth and adipogenesis (Du et al. 2013), and improve marbling and quality grades in feedlot cattle (Larson et al. 2009; Shoup et al. 2015b). Less is known regarding how foetal environment impacts the reproductive performance of female progeny. Protein supplementation to cows grazing winter range in late gestation has resulted in increased 205d, prebreeding, and pregnancy diagnosis BW of daughters compared with daughters of cows not supplemented protein (Martin et al. 2007). In addition, improved skeletal growth in heifer progeny born to heifers fed dried distiller’s grains during late gestation and early lactation has been observed (Gunn et al. 2015). Improved overall pregnancy rates have been observed in heifers born to supplemented cows grazing winter range (Martin et al. 2007; Funston et al. 2010). Gestational dietary intake has been shown to inconsistently influence ovarian measures in female foetuses carried by heifers (Sullivan et al. 2009; Gunn et al. 2015) and sheep (Da Silva et al. 2002). Obese cows bore calves with reduced birth weights and weaning weights (Hughes et al. 1978). However, none of these studies have followed the heifer progeny of overfed dams grazing tall fescue in a fall-calving system beyond weaning and evaluated reproductive performance. It was hypothesised growth and reproductive performance would be improved in heifers from cows provided a low level of supplement compared with heifers born to cows not supplemented and cows overfed supplement. Our objectives were to determine the effect of prepartum dam supplement level on growth performance, feed efficiency and reproductive performance of female progeny in beef cattle.
Materials and methods

The Institutional Animal Care and Use Committee of the University of Illinois approved the procedures used in this experiment. This experiment was conducted at the University of Illinois’ Dixon Springs Agricultural Center in Simpson, IL.

Animals, experimental design, and treatments

Mature, multiparous, Angus × Simmental cows (year 1: 326 cows, n = 9 pastures, initial age = 5.5 ± 2.0 years, initial BW = 632 ± 67 kg, initial BCS = 5.7 ± 0.58; year 2: 383 cows, n = 9 pastures, initial age = 5.7 ± 1.7 years, initial BW = 606 ± 70 kg, initial BCS = 5.8 ± 0.74) were used in a completely randomised design that included three supplement levels: no supplement (NS), low supplement, 2.16 kg

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and 30% soybean hulls). The study was designed to feed these 3 supplement levels to achieve diverging nutritional statuses in late gestation to cows grazing tall fescue. In the summer during a typical year, forage quality does not meet nutritional needs of mature, fall-calving cows at this location. It was assumed a 635-kg cow in late gestation would consume 1.75% of BW of mature fescue (44% TDN; NRC 1996), resulting in 4.88 kg TDN, which would be 75% of requirement (NRC 1996). The addition of 2.1 kg/d of supplement (70% DDGS/30% soybean hulls) to the same cow during late gestation would provide 103% of TDN requirement. Previous work at this research station supports 2.1 kg/d of supplement as being adequate to meet requirements of cows grazing mature fescue during late gestation (Wilson et al. 2015). To achieve a level of overfeeding, a pilot study at this research station was conducted that deemed 8.61 kg-cow⁻¹-d⁻¹ to be the maximum amount of DDGS-based daily supplement that was consistently eaten by similar cows grazing the same pasture.

Supplementation was initiated at 103 ± 11 d preparrturn to cows grazing endophyte-infected tall fescue/ red clover pastures. Supplementation began during the last trimester because, from a management perspective, it is often in this phase of gestation that fall-calving cows are supplemented to support pastures declining in forage quality during mid-summer. There is less practical incentive to supplement in mid-gestation when the forage quality is better for fall-calving cows. Based on previous work (Martin et al. 2007; Funston et al. 2010) supplementation in late gestation has altered heifer progeny performance and reproduction. Therefore, there was still potential for foetal programming to occur in late gestation.

A free-choice salt and mineral block (Renaissance Nutrition, Roaring Springs, PA: 21.4% salt, 16.9% Ca, 8.5% Na, 7.1% P, 5.9% Mg, 1.1% K, 997 mg/kg Cu, 25.9 mg/kg Se, 109 kIU/kg vitamin A, and 5.7 g/kg chlortetracycline) was provided to all the cows throughout the experimental period. Supplementation was halted at 2 ± 11 d postpartum and cows were consolidated into three pastures, each containing 1 NS, 1 LS, and 1 HS cow group. Following consolidation, all cows received 2.14 kg of DDGS + Co-Product Balancer (Purina Animal Nutrition, Saint Paul, MN: 772 mg/kg monensin, 25% CP, 2% crude fat, 8% crude fibre, 13% Ca, 3.5% NaCl, 0.1% K, and 52,911 IU/kg vitamin A) daily. Further details of dam management can be found in Shoup et al. (2015a). Heifer calves born to these dams are the subjects of this study and their management is described below.

Heifer management

All heifers (127 in year 1; 138 in year 2) were vaccinated with Bovishield Gold FPS VL5 HB (Pfizer), One Shot Ultra 7 (Pfizer), and Pulmo-Guard MpB (Boehringer Ingelheim Pharmaceuticals Inc.) at 49 ± 11 and 78 ± 11 d of age. A final booster was administered at weaning (186 ± 11 d of age) and BW was collected. Following weaning, heifers were managed as one group. Heifers grazed endophyte-infected tall fescue/red clover pastures and were provided a free-choice salt and mineral block at a target daily consumption of 57 g (Renaissance Nutrition, Roaring Springs, PA: 21.4% salt, 16.9% Ca, 8.5% Na, 7.1% P, 5.9% Mg, 1.1% K, 997 mg/kg Cu, 25.9 mg/kg Se, 109 kIU/kg vitamin A, and 5.7 g/kg chlortetracycline) throughout the study. Heifers were rotated to new pastures based on visual appraisal of forage availability by farm staff. The average stocking rate was 10.6 heifers per hectare from March (weaning) through mid-October.

Before breeding, heifers were vaccinated with Covexin 8 (Merck), Bovishield Gold FPS VL5 HB (Pfizer), and ScourGuard 4KC (Pfizer). In both years, heifers were supplemented DDGS (30% CP and 88% TDN; NRC 1996) from mid-October through mid-January (3.3 kg-heifer⁻¹-d⁻¹ and 2.4 kg-heifer⁻¹-d⁻¹ for years 1 and 2, respectively) while continuing to graze endo-phyte-infected tall fescue/red clover pastures at an average stocking rate of 10.9 heifers per hectare. Heifers were synchronised using the timed AI Co-Synch + controlled internal drug release (CIDR) procedure (Johnson et al. 2013), artificially inseminated at
433 ± 11 d of age (November), and BW and BCS (emaciated = 1; obese = 9; as described by Wagner et al. [1988]) were collected. Subsequently, BW as a percent of mature BW was calculated at time of breeding. Mature BW was assumed to be initial average weight of the dams. Pregnancy was confirmed for Al at 58 ± 3 d post-Al and BW was collected. Ten d following Al, heifers were exposed to bulls for 73 ± 11 d. Overall pregnancy rate was confirmed 45 ± 4 d after bull removal. First-service AI conception and overall pregnancy were determined by a trained technician via ultrasonography (Aloka 500 instrument, Wallingford, CT; 7.5 MHz general purpose transducer array). Calving rate was calculated at the end of the calving season by dividing the number of heifers producing a calf by the total number of heifers inseminated at 433 ± 11 d of age.

From mid-January through mid-April, heifers were managed as a single group and fed 10.5 kg heifer⁻¹ d⁻¹ of a mixed ration (31% DDGS; 23% corn; 46% silage; 15% CP; 79% TDN; NRC 1996) in year 1 and 7.3 kg heifer⁻¹ d⁻¹ of a mixed ration (39% DDGS; 33% corn; 28% hay; 19% CP; 80% TDN; NRC 1996) in year 2. Heifers had continual access to dormant endophyte-infected tall fescue/red clover pastures at an average stocking rate of 11.9 heifers per hectare. When spring growth of grass began, feeding of the mixed ration ceased and heifers grazed only endophyte-infected tall fescue/red clover pastures at an average stocking rate of 5.0 heifers per hectare until their calves were weaned (December).

Before calving, heifers were vaccinated with an Ivermectin anthelmintic, ScourGuard 4KC (Pfizer), Bovishield Gold FPS VLS HB (Pfizer), Covexin 8 (Merck), and MU-SE (Schering-Plough Animal Health). Upon calving, calving date, calf birth BW, and calving ease were recorded by trained staff. Average calving date was September 9, 2013 ± 27 d of age and September 5, 2014 ± 24 d of age for year 1 and 2, respectively. At 73 ± 16 d post-partum, milk production was estimated via the weigh-suckle-weigh (WSW) technique as described by Beal et al. (1990). All calves were early-weaned at 97 ± 7 d of age.

**Feed efficiency evaluation**

Individual feed intake was measured using GrowSafe (GrowSafe Systems Ltd., Airdrie, AB, Canada). A 70 d intake and feed efficiency evaluation was conducted at 292 ± 39 d of age in year 1 and 317 ± 12 d of age in year 2. Beef Improvement Federation guidelines were followed for acclimation of animals to the GrowSafe system and a minimum of 60 d were used in the efficiency evaluation from each 70 d feeding trial. Diets differed between year 1 and year 2 because of a lack of hay and increased availability of corn baleage after the 2012 drought. In year 1, heifers were split evenly by treatment across two feeding periods due to space limitations and, in year 2, all heifers were fed in 1 feeding period. Heifer BW was collected on two consecutive d at the start (d 0 of efficiency evaluation) and end (d 70 of efficiency evaluation) of the feeding period and averaged for an initial BW and final BW. Interim BW was collected 14, 28, 42, and 57 d throughout the feeding period. For each heifer, BW was regressed on d of efficiency evaluation period. Intercept and regressed ADG was used to calculate mid-test BW, d 35, for each heifer. Mid-test metabolic BW (MMW) of each heifer was calculated as mid-test BW0.75. The residual from the regression of DMI on regressed ADG and MMW was considered RFI and was calculated independently within each group (2 groups in year 1; 1 group in year 2).

**Feed sampling and analysis**

Nutrient composition of the DDGS/soybean hulls supplement fed to dams can be found in Shoup et al. (2015a). Composited feed samples from the feed efficiency evaluation (Table 1) were ground using a Wiley mill (1-mm screen, Arthur H. Thomas, Philadelphia, PA). Ground ingredients were analysed for ADF and NDF (using Ankom Technology method 5 and 6, respectively; Ankom Technology), CP (Leco TruMac, LECO Corporation, St. Joseph, MI), fat (method 2; Ankom Technology), and total ash (600°C for a minimum of 2 h, Thermolyne muffle oven model F30420C, Thermo Scientific, Waltham, MA). Total digestible nutrients

| Item                  | Year 1 | Year 2 (d0–d42) | Year 2 (d43–d70) |
|-----------------------|--------|-----------------|-----------------|
| Inclusion, % DM       |        |                 |                 |
| Ingredient, %         |        |                 |                 |
| Grass hay             | 100.0  | 42.0            | 39.0            |
| Alfalfa hay           |        | 28.0            |                 |
| Fescue hay            | 24.5   |                 |                 |
| Cornstalk baleage     |        | 33.5            | 33.0            |
| Soybean hulls, pelleted| 13.5  | 14.1            | 12.8            |
| Analysed nutrient content, % | 63.4 | 55.1            | 60.2            |
| CP                    | 53.7   | 38.9            | 43.4            |
| NDF                   | 1.3    | 1.3             | 1.4             |
| ADF                   |        |                 |                 |
| Calculated energy content | 44.9 | 52.0            | 47.4            |

*Total digestible nutrients was back-calculated from CP and ADF using TDN =81.38 + (CP * 0.36) – (ADF * 0.77) for year 1 hay and TDN =90.82 + (CP * 0.0355) – (ADF * 1.01).*
(TDN, Table 1) was back-calculated from CP and ADF using $\text{TDN} = 81.38 + (\text{CP} \times 0.36) - (\text{ADF} \times 0.77)$ for year 1 hay and $\text{TDN} = 90.82 + (\text{CP} \times 0.0353) - (\text{ADF} - 1.01)$ for year 2 diets (Clemson University Agricultural Service Laboratory 1996).

**Statistical analysis**

A completely randomised design was used in this study and dam pasture was the experimental unit. The MIXED procedure (SAS Inst. Inc., Cary, NC) was used to analyse all variables. Supplement level (NS, LS, or HS), year (1 or 2), and supplement level × year were included as fixed effects in models of all variables. Binomial data (AI pregnancy rate, overall pregnancy rate, percentage of heifers that calved unassisted, and calving rate) were converted to a working variable ($\sin^{-1}(y)$) as described by Humblot et al. (1991) due to non-normality. When $x = 0$, the observation 0 was replaced with $(1/4)$ $(1/n)$ and when $x = 1$, the observation was replaced with $[1 - (1/4) (1/n)]$ (Bartlett 1947). Estimates (of $y$) were back-transformed using $(\sin(y))^2$ and are reported below. The PDIFF statement was used to separate least square means at significance of $p \leq .05$ and trends at $p > .05$ to $\leq .10$.

**Results**

Dam treatments were designed to result in divergent cow BW and BCS. Cow performance and calf weaning data are reported in a previous paper (Shoup et al. 2015a). Dams fed HS had a significantly greater pre-calving, post-calving, and post-breeding BW compared with cows fed NS or LS. Pre-calving BCS was greater for cows fed HS (6.8) and LS (6.6) compared with cows fed NS (6.0). At post-calving, cows fed HS had the greatest BCS (6.8) while cows fed NS had the least (5.8) and cows fed LS were intermediate (6.1). The effects of the divergent cow BW and BCS during gestation on heifer development are presented below.

Weaning BW did not differ ($p = .99$) among heifers born to cows fed different supplement levels (Table 2). In addition, feed efficiency measures collected during the feed efficiency evaluation which included initial BW, final BW, ADG, DMI, and RFI did not differ ($p \geq .14$) among heifers from cows fed different supplement levels. The only feed efficiency response variable with a tendency ($p = .10$) to differ among dam treatment was G:F.

Dam prepartum supplement level did not affect ($p \geq .60$) any first-parity measures (Table 3) including

![Table 2. Effect of dam prepartum supplement level on heifer progeny growth and performance.](image)

| Supplement | n, dam pasture |  |  |  |  |
|------------|----------------|-----------------|-----------------|-----------------|-----------------|
| NS         | 6              | 6               | 6               | NS              | 6               |
| LS         | 177            | 177             | 178             | 5.5             | .01             |
| HS         | 253            | 253             | 256             | 5.6             | .01             |
| SE year SUP |                |                |                | .01             | .01             |
|           |                |                |                | .99             | .89             |
| Initial BW, kg | 300        | 304             | 307             | 6.5             | .01             |
| DMI, kg     | 7.9            | 8.1             | 8.2             | .18             | .01             |
| RFI         | 0.050          | 0.002           | 0.079           | 0.088           | .76             |

**Table 3. Effects of dam prepartum supplement level on heifer progeny performance.**

| Supplement | n, dam pasture |  |  |  |  |
|------------|----------------|-----------------|-----------------|-----------------|-----------------|
| NS         | 6              | 6               | 6               | 6               |
| LS         | 315            | 314             | 322             | 5.5             | .01             |
| HS         | 51             | 51              | 52              | 0.9             | .01             |
| SE year SUP |                |                |                | .60             | .61             |
| Breeding BW, kg | 5.0          | 5.0             | 5.0             | 0.07            | .01             |
| Pregnancy check BW, kg | 337        | 337             | 345             | 6.1             | .08             |
| AI conception rate, % | 31        | 39              | 43              | 0.08            | .20             |
| Overall pregnancy rate, % | 82        | 81              | 92              | 0.06            | .67             |
| Calving rate, % | 68        | 67              | 75              | 0.08            | .79             |

**Discussion**

The lack of difference in weaning BW is in contrast from Hughes et al. (1978) who found progeny from obese cows to have reduced weaning weights. The weaning BW response in Hughes et al. (1978) is likely due to pre-existing differences in birth BW. Other studies have found an improvement in calf weaning BW if
dams were supplemented with protein during late gestation while grazing subirrigated meadow or hay (Stalker et al. 2006) or winter range (Larson et al. 2009). The authors speculated this may have been due to differences in milk production of the dams, although milk production was not measured in those experiments. Since cow age and Julian calving date were similar among supplement levels in the present study (data not shown; \( p \geq .72 \)) and calf birth BW and milk production (Shoup et al. 2015a) did not differ by treatment, it is no surprise that weaning BW did not differ in the present study.

The results of the feed efficiency evaluation are not surprising as dam supplement level did not affect ADG or DMI of the steer counterparts of the heifers used in the present study (Shoup et al. 2015b). No differences in ADG, DMI, or RFI were observed in heifers (Martin et al. 2007). Martin et al. (2007) found prebreeding and pregnancy diagnosis BW of heifers born to dams on different planes of nutrition in late-gestation. Conversely, Martin et al. (2007) found prebreeding and pregnancy diagnosis BW to be greater for heifers born to supplemented heifers compared with female progeny born to dams fed a corn silage-based control diet. The authors attributed these differences to a numerical weaning BW advantage carried through from earlier in life (Martin et al. 2007).

Feed efficiency (G:F) was inconsistent between the heifer progeny evaluated in the present study and steer progeny (Shoup et al. 2015b). Heifers born to dams fed LS had the greatest numerical G:F; whereas, with the steer progeny, there were no differences in G:F (Shoup et al. 2015b). The effects of late gestation nutrition on progeny feed efficiency are mixed. Funston et al. (2010) observed improved G:F in heifers born to dams not supplemented while grazing corn residue, but no differences were reported with the male counterparts (Larson et al. 2009), or when dams grazed winter range (Funston et al. 2010), or in other late-gestation supplementation studies (Stalker et al. 2006; Martin et al. 2007). As Funston et al. (2010) acknowledged, feed efficiency differences between steer and heifer progeny may be inconsistent due to the high energy content of the steer diet targeted to maximise ADG. Although the timing of supplementation relative to gestation was similar among all of these experiments, the base forage and supplements as well as calving season differed (all other studies were in a spring-calving system). These differences likely contributed to the inconsistent responses.

Gunn et al. (2015) found a tendency for female progeny from dams fed DDGS to have a greater BW and greater frame size compared with female progeny born to dams fed a corn silage-based control diet. The same response was not observed in the present study; however, treatments in Gunn et al. (2015) were extended through 118 d in lactation. Differences in heifer progeny growth may have been attributed to differences in milk composition of the dams reported in Gunn et al. (2014). Others (Funston et al. 2010; Warner et al. 2011; Cushman et al. 2014) have reported no differences in breeding and pregnancy diagnosis BW of heifers born to dams on different planes of nutrition in late-gestation. Conversely, Martin et al. (2007) found prebreeding and pregnancy diagnosis BW to be greater for heifers born to supplemented cows. However, because ADG was similar, the authors attributed these differences to a numerical weaning BW advantage carried through from earlier in life (Martin et al. 2007).

The reduced AI conception results of the present study are possibly due to the relatively low (51–52) percent of mature BW at breeding. It has been shown that a greater BW at the start of the breeding season has resulted in improved conception during the first 20 d of the breeding season (Wiltbank et al. 1985). In general, according to the NRC (1996), pregnancy should not be impaired if 55 to 65% of mature BW is met. However, Martin et al. (2007) compared heifers at either 50% or 55% of mature BW at breeding and found similar pregnancy rates.

After a 5-d Select-Synch + CIDR and timed-AI (TAI) protocol, Gunn et al. (2015) reported an improvement in AI conception in heifers born to heifers fed DDGS throughout late-gestation and early-lactation. This observation contradicted their hypothesis that DDGS-fed heifers would bear heifer progeny with reduced reproductive development and poorer fertility based on prenatal dietary crude protein’s effects on reproductive development of female progeny reported in Sullivan et al. (2009). Gunn et al. (2015) observed no differences in ovarian characteristics and overall pregnancy, so the authors were unable to account for the differences in AI conception. Cushman et al. (2014)

### Table 4. Effect of dam prepartum supplement level on heifer progeny’s first calf performance.

| Item                        | NS | LS  | HS  | SE  | year  | SUP  |
|-----------------------------|----|-----|-----|-----|-------|------|
| n, dam pasture              | 6  | 6   | 6   | -   | -     | -    |
| Calving datea               | 253| 252 | 249 | 3.7 | .35   | .72  |
| Calved unassisted, %        | 97 | 97  | 95  | 0.03| .18   | .43  |
| Calf birth BW, kg           | 29 | 31  | 30  | 0.9 | .10   | .32  |
| Milk production, kgb        | 5.1| 5.7 | 5.2 | 0.34| .01   | .48  |
| Calf BW at WSW, kg         | 86 | 92  | 89  | 2.4 | .15   | .24  |

aDam supplement level: NS = no supplement; LS = low supplement, 2.16 kg cow\(^{-1}\)d\(^{-1}\); HS = high supplement, 8.61 kg cow\(^{-1}\)d\(^{-1}\).
bSUP = supplement level; SUP × year ≥0.27.
cStandard error for percent calving unassisted are in transformed units.
dUnique combination of d and month. For example, 253 = September 10th.
e73 ± 16 d post-partum.
fCalf BW collected at weigh-suckle-weigh; 73 ± 16 d of age.
found antral follicle count and overall pregnancy rate of heifer progeny of mature cows to not be affected by different nutrient statuses during the 2nd and 3rd trimesters. Cushman suggested that heifer progeny follicle count was similar because mature cows were used in their study instead of heifers, as in Sullivan et al. (2009). Like Cushman et al. (2014), mature cows were used in the present study. This could contribute to the lack of differences observed in AI conception and overall pregnancy. However, we can only speculate because ovarian characteristics were not measured.

Other work utilising mature cows has resulted in improved overall pregnancy rate (Martin et al. 2007; Funston et al. 2010) in female progeny born to dams supplemented during late gestation. Several differences may explain the inconsistent results between those studies and the present study, including forage type and calving season. In the present study, fall-calving cows were grazing, predominately, mature tall fescue during summer. Martin et al. (2007) and Funston et al. (2010) utilised spring-calving cows that were grazing hay, winter range, or cornstalk residue in the late winter. These differences in calving season and forage type between Martin et al. (2007), Funston et al. (2010), and the present study are likely responsible for the differences in nutritional status of the cows at the start of the respective studies. All cows in the present study had an average BCS of 5.7 when supplementation was initiated and cows fed NS maintained a 6.0 BCS at pre-calving. In the companion papers to Martin et al. (2007) and Funston et al. (2010), cows started with an average BCS of 5.2 (Stalker et al. 2006) and the cows not fed a supplement had a BCS of 4.7 and 5.0 (Stalker et al. 2006; Larson et al. 2009) at pre-calving. Had cows fed NS in the present study been in a less adequate BCS at calving, an improvement in AI and overall pregnancy rate may have been observed in heifers from dams that had been supplemented.

Others also found no differences of late-gestation dam supplementation on heifer progeny’s first-calf birth BW (Martin et al. 2007; Funston et al. 2010; Cushman et al. 2014), calving date (Martin et al. 2007; Funston et al. 2010), or percentage of heifers calving unassisted (Martin et al. 2007). Making any comparisons regarding milk production is difficult since none of the other works estimated milk production (Martin et al. 2007; Funston et al. 2010; Cushman et al. 2014; Gunn et al. 2015). Dam supplement level did not affect calf BW at weigh suckle weigh (73±16 d of age) which is reasonable considering there were no differences in calf birth BW or milk production.

Conclusions

In conclusion, dam supplement level did not impact growth performance, DMI, RFI or first-parity reproductive performance of heifer progeny born to mature, fall-calving beef cows grazing tall fescue. These results suggest, in this type of production setting, a higher plane of nutrition only results in dams gaining body condition and does not alter progeny development during late gestation. However, as other work has indicated, results may be different when applied in an alternative management system and to dams with less body condition.

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Disclosure statement

There are no conflicts of interest with this research.

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