

# **EVALUATION OF PROGENY PERFORMANCE USING CARCASS DATA FROM BEEF INFOXCHANGE SYSTEM (BIXS)**

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## **Introduction**

Utilizing annual crop residues or stockpiled forage in beef cow diets has the potential to reduce winter feed costs (Krause et al., 2013; Kulathunga et al., 2014; Damiran et al., 2016). The impacts on the carcass quality of progeny born to cows winter fed in extensive systems are less understood. However, the impact of dam nutrition on the subsequent performance of progeny, a field of study known as fetal programming, is gaining increasing attention (Martin et al., 2007; Funston et al., 2009). Fetal programming studies require retained ownership to ensure the appropriate measures are taken and that animals are treated similarly to control the factors influencing progeny performance. Retained ownership will yield feedlot performance data and carcass quality information. While retained ownership is utilized by Western Beef in some of its studies, typically just the birth weight and weaning weight of the calves born to cows on winter feeding studies is measured, while backgrounding and feedlot performance and carcass quality are often beyond the scope of a study due to cost and time.

The Beef InfoXchange System (**BIXS**), implemented in fall of 2011, is a way for cow-calf producers to retrieve carcass and feedlot performance data for animals originating from their operations<sup>1</sup>. The Beef InfoXchange System is a voluntary database and information exchange system where individual animal and carcass data are linked to the RFID tag (electronic ID) that every animal marketed in Canada must have.

Western Beef Development Centre (**WBDC**) registered for BIXS in May 2012 and has downloaded all available carcass records for its animals in the system. The carcass records were cross-referenced with the records of progeny born to cows that were over-wintered in its crop residue and stockpiled forage studies, with the objective being to determine the effects of the these feeding systems on progeny carcass performance.

## **Winter feeding studies at Western Beef Development Centre**

Typically, winter grazing studies conducted at WBDC's Termuende Research Ranch are three years in length. Detailed information on recent (2009-2011) winter feeding studies at WBDC can be found in Krause et al. (2013) and Kulathunga et al. (2016). In these studies cows were randomly allocated to the feeding systems being

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<sup>1</sup> To date, only animals with birthdates Jan 1, 2010 and later have data in BIXS and only carcass data from animals slaughtered in either of the two federally-inspected plants in Alberta (Cargill or JBS) prior to March 31, 2014 is available.

investigated. Cow body weights were measured biweekly and rations were adjusted (if necessary) to maintain body condition, with no weight gain above that of her growing calf (conceptus growth). Calf birthdate and birthweight were measured, however, no information beyond weaning was tracked for these calves.

Carcass data through BIXS is only available for animals born after January 1, 2010, therefore, the progeny from cows involved in winter feeding studies in Fall/Winter 2009-10 (prior to 2010 calving), 2010-11 and 2011-12 were included in this study. The winter feeding system studies in effect during those fall/winter years were: (i) Oat crop residue (chaff+straw) grazing (**OAT**); (ii) Pea crop residue (chaff+straw) grazing (**PEA**); (iii) stockpiled perennial forage swath grazing (**SPF**) with supplementation; and (iv) drylot (**DL**) pen feeding round bale hay in bale feeders. Each feeding system (n = 4) had 3 replicates (n = 3; 3 paddocks and pens for grazing and feeding system, respectively) and each replicate group consisted of 10 cows.

### Animal carcass characteristics data collection

All carcass characteristics data were obtained from the BIXS database (<http://www.bixsco.com/>). While all players in the supply chain can enter data about their animals, no backgrounding or feedlot finishing data was available for WBDC's 2010-2012- born calves in BIXS. Limited carcass data were available through BIXS (**Table 1**). A total of 838 calves were weaned at the Termuende Research Ranch from 2010 to 2012. Of these, 606 head were marketed at time of weaning. The other 232 head were retained for backgrounding studies or for replacements. As of April 2014, only 24% (147 head) of the weaned calves marketed by Termuende Research Ranch from 2010-2012 have carcass data in

Item	2010	2011	2012	Total
# of Calves weaned	263	273	302	838
# of Calves sold at weaning	198	187	221	606
# of Head in BIXS	23	107	17	147
% of Head sold in BIXS	12%	57%	7%	24%

Source: BIXS, WBDC production records.

BIXS. Close to 60% of the 2011-born calves have carcass data in BIXS, but only 12% of the 2010-born calves and 7% of the 2012-born calves<sup>2</sup>. Of WBDC's 147 head with carcass data in BIXS, only 78 (53%) were born to dams that were part of one of the winter feeding system studies (crop residue, stockpiled forage, and drylot) being researched from 2009-2011.

Given that over 75% of the weaned calves marketed by WBDC from 2010-2012 do not have carcass grade information in BIXS, the electronic IDs for 2010 and 2011-born calves were provided to the Canadian Cattle Identification Agency (**CCIA**) for cross-reference to determine if the animal's tag was retired, if the animal was exported or if the animal's tag still active (i.e. animal still alive or animal's tag not retired if it died at a feedlot). Seventy five percent of the 2010-born and 39% of the 2011-born calves not found in BIXS, had their tags retired, suggesting they were

<sup>2</sup> Carcass data stopped flowing into BIXS in 2014, BIXSCO has been negotiating with packers to resume data flow and encouraging producers, backgrounders and feeders to register and enter their data. Once registered, any animals age-verified through CCIA automatically transfer into BIXS database and vice versa.

slaughtered at a facility other than Cargill or JBS or died before reaching slaughter (**Table 2**)<sup>3</sup>. Forty five percent of the 2011-

born marketed calves were exported

compared to 6% of the 2010-born. Eighteen percent (47 of 255 head) of the 2010 and 2011-born WBDC calves with no

carcass information in BIXS still had active CCIA tags, suggesting they were still alive (i.e. tags not retired) as of October 1, 2013.

**Table 2. CCIA status for WBDC calves not in BIXS**

Item	2010	2011	2012 <sup>1</sup>	Total
# of Sold Calves not in BIXS	175	80	204	459
CCIA - Tag Retired	75%	39%	n/a	64%
CCIA - Exported	6%	45%	n/a	18%
CCIA - Still Alive/Tag Not Retired	19%	16%	n/a	18%

<sup>1</sup> A similar request was submitted to CCIA on November 25, 2013 for the status on 2012-born calves, however, no information has been received.  
Source: CCIA, October 1, 2013.

### Results and Discussion

Cows on different winter feeding systems did not differ in BW and BCS at calving, which averaged 1449 lb and 2.5, respectively (**Table 3**). An average body condition score of 2.5 means they were in fair condition at calving period. As others have noted (Selk et al., 1988), when cow BCS falls below 2.5 in pre-calving period, cow reproduction can be negatively affected. Calf birth weight averaged 88 lb with birthweights tending to be heavier for drylot pen fed and pea crop residue grazed dams (**Table 3**). Weaning weights averaged 480 lb, ranging from 425 lb for OAT and 501 lb for PEA.

At slaughter, the progeny born to dams involved in the crop residue (OAT or PEA), SPF, and DL treatments showed no significant differences in hot carcass weight, USDA yield grade, marbling score, ribeye area, and backfat thickness. Despite an uneven number (or limited number of animals) of data points per treatment, some trend in carcass quality was noted and deserves further study. Progeny from dams that were on crop residue grazing tended to have a higher number of calves, 92.6 and 100%, OAT and PEA, respectively, that graded Canada AAA compared to progeny from DL and SPF dams. Only progeny from SPF dams were graded Prime (2.9%) and none of the progeny was graded Canada A (the lowest of the high quality grades in Canada). Progeny hot carcass weight was not affected by dam's winter feeding system and averaged 898 lb.

### Conclusions and Implications

This limited data indicated winter feeding pregnant beef cows in extensive systems (i.e., crop residue or stockpiled perennial forage) did not have a significant impact on the carcass quality of their calves. Eighty-three percent of the calves graded AAA, which is above the national average (60.8% in 2015). There were 333 calves weaned from dams on the crop residue and stockpiled forage studies, but only carcass data for 78 head in BIXS. While the BIXS results are interesting, more records are needed to draw inferences about the effects of winter feeding systems on progeny carcass performance, reaffirming Western Beef's need to retain ownership to ensure meaningful numbers are obtained for fetal programming research.

<sup>3</sup> CCIA only indicates the tag is "Retired", due to privacy they cannot release information on the facility/location so unable to know if tag retired at slaughter or death in feedlot.

**Table 3. Evaluation of feedlot performance of calves born from cows on different winter feeding systems using BIXS data<sup>1</sup>**

Item	DL	OAT	PEA	SPF
No. of pairs (cow, calf)	32	11	11	24
Cow performance at calving				
BW, lb	1438	1530	1502	1406
Body condition score	2.5	2.6	2.6	2.5
Calf performance				
Calf birth BW, lb	91	83	92	85
Calf Weaning Weight, lb	496	425	501	497
Age at processing, month	18.6	18.1	20.1	19.2
Hot carcass weight, lb	900	890	918	891
Quality grade, %				
Canada prime	-	-	-	2.9
Canada AAA	67.9	92.6	100.0	74.0
Canada AA	31.1	7.4	-	23.0
Yield grade <sup>2</sup>	3.4	3.6	3.6	3.9
Marbling score <sup>3</sup>	460	490	488	483
Ribeye area, cm <sup>2</sup>	89.4	88.0	89.0	85.6
Backfat thickness, cm	1.4	1.7	1.6	1.8
<sup>1</sup> DL = cows drylot pen feeding; OAT = cows oat crop residue grazing in field paddocks; PEA = cows pea crop residue grazing in field paddocks; SPF = cows stockpiled perennial forage grazing in field paddocks. <sup>2</sup> Yield grade as determined according to a USDA grading procedure (American Meat Science Association, 1990). <sup>3</sup> Marbling score, grade fat thickness, and ribeye area as determined according to Canadian Beef Grading Agency (2009).				

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