UNIVERSITY OF SASKATCHEWAN
College of Agriculture
and Bioresources
DEPARTMENT OF AGRICULTURAL
AND RESOURCE ECONOMICS
AGBIO.USASK.CA

FACT SHEET
#2024-01

FEED TESTING USE BY WESTERN CANADIAN COW-CALF PRODUCERS

By: Claire Owen MSc and Kathy Larson MSc

Overview

An online survey of Western Canadian cow-calf producers (n=324) was conducted during Winter 2022/23 to better understand how and why cow-calf producers are utilizing feed testing and its complementary practices. By learning what producers currently do we can tailor extension efforts to increase the adoption of annual feed testing among cow-calf producers.

Close to 60% (192/324) of survey respondents tested at least some feed in the previous three years with nearly half of testers (47%) reporting that feed testing has been a long-term practice on their operation. The probability of feed testing was statistically higher when an operation had over 100 cows ($P<0.02$), retained ownership ($P=0.0003$), and bale weights ($P=0.0004$). Complementary practices had higher rates of adoption among feed testers in the sample; water testing (61% vs 47%), toxin testing (76% vs 16%), chelated mineral use (36% vs 23%), weigh cows (32% vs 12%), body condition score (53% vs 44%) and trace mineral test (13% vs 4%). Cowbytes is the most common program used for on-farm ration balancing among feed testers in the sample, however, the majority of feed testers rely on third parties for test package selection (49%) and ration balancing support (61%).

Background

Recent cost of production analysis reports winter feed accounts for approximately 40% of total production costs (Canfax, 2024; Agriprofit$ 2024). In an effort to manage feed costs and meet nutritional requirements of beef animals producers are encouraged to have the quality of their feedstuffs lab-tested at least annually and to use the results to develop least-cost, balanced rations.

We know from recent industry surveys conducted in 2014 and 2017 that less than 40% of cow-calf producers test feed annually even though feed is a producer's largest expense and not meeting nutrient requirements can negatively impact reproduction and productivity.

The most common reason selected by non-testers for not testing is “the cows look healthy so the feed must be adequate” (BCRC 2024, 2019). While cows may not show clinical signs of inadequate nutrition, if their nutrient requirements are not met they will pause certain functions and the first functions to be paused deal with reproduction (e.g. estrus and pregnancy initiation). This is known as nutrient partitioning which was first explained by Short and Adams (1988) over 35 years ago.

The low rates of feed testing noted through industry surveys prompted the Beef Cattle Research Council to fund Knowledge & Tech Transfer projects aimed at increasing the percentage of cow-calf producers who are annually testing their feed for quality. Beyond the few minor questions asked in industry surveys not much was known about the use of feed testing and ration balancing among cow-calf producers.

What We Did

To support BCRC in its goal to increase the percentage of cow-calf producers who feed test annually, an online survey was conducted by Insightrix (Saskatoon, SK) in Winter 2022/23. The survey targeted Western Canadian cow-calf producers and asked questions about their operation and their use of feed testing, ration balancing and related practices.

Focus groups were conducted with individuals knowledgeable in ruminant nutrition to ask questions about feed testing including possible impediments and alternatives. The findings of the focus groups were used in the development of the survey questions. The survey was distributed to Insightrix’s panel and a link was shared through known networks (e.g. industry association e-communications) resulting in a non-probability sample.

The responses were reviewed for accuracy and completeness. Reported in this fact sheet are summary statistics (counts, frequencies) and statistical analyses estimating the associations between feed testing and producer/operation attributes and related practices.

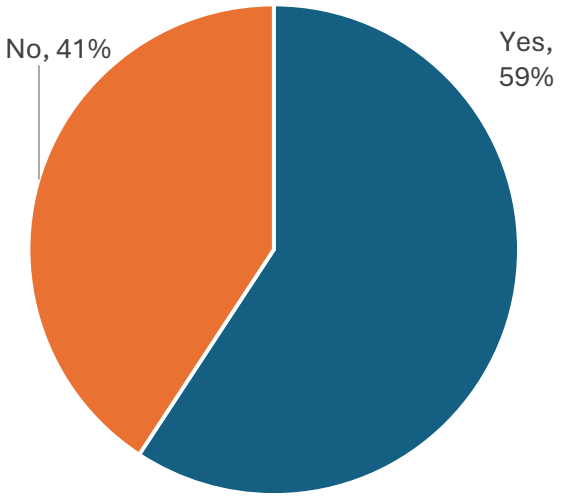


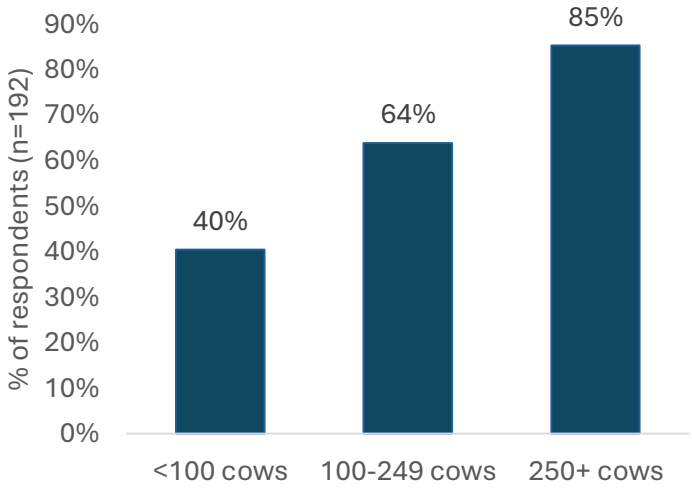
Figure 1. Feed Tested AT LEAST once in last 3 yr (2020-2022)? (n=324)

Results & Discussion

A total of 324 survey responses were analyzed. Close to 60% of respondents had

tested feed at least once in the last three years (Figure 1) with 47% of testers (28% of total respondents) reporting that feed testing was part of a long-term strategy on their operation. Twenty-five percent of the feed testers categorized themselves as recent adopters of the practice. Herd size was positively associated with feed testing with larger herds having higher rates of adoption (Figure 2).

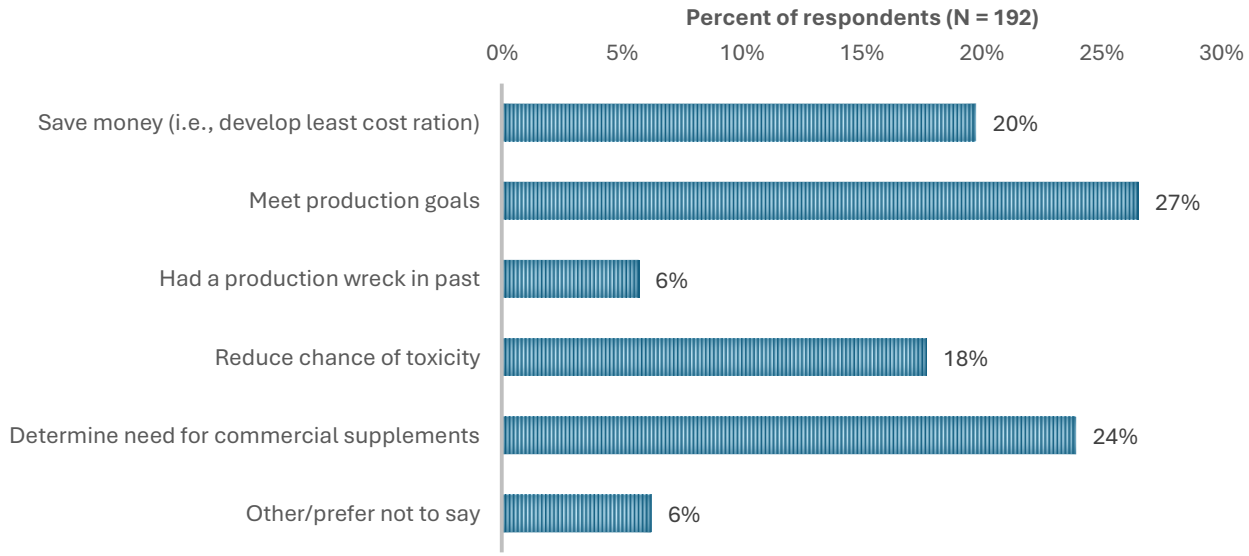
Figure 2. Feed Testing Adoption by Number of Beef Cows



Top Reason for Feed Testing

The top three reasons selected for feed testing were to: meet production goals (27%), determine commercial supplement requirements (24%) and save money (20%) (Figure 3). Less than 10% of feed testers in the sample picked a past production wreck as the top reason they were feed testing.

Figure 3. Top reason FOR feed testing



Non-testers (n=132) were asked to pick which of seven reasons best explained why they did not feed test. Similar to the 2017 and 2023 industry surveys the top reason selected for not testing was “My cattle seem healthy, so I see no need to test” (66%). The second most

common reason for not testing was the cost (20%). About 15% of non-testers also indicated that they do not test because they are unsure about some of the steps (e.g. lab selection, collecting samples, test package, interpreting results). The table at the end of this fact sheet provides links to existing online resources that provide guidance on many of these "steps".

Complementary practices

Feed testing goes hand in hand with other practices such as water testing, body condition scoring, trace mineral testing (liver/blood), feeding chelated mineral, and testing for toxins. Figure 4 shows feed testers had higher rates of adoption for all complementary practices shown compared to respondents who did not feed test (i.e. non-tester).

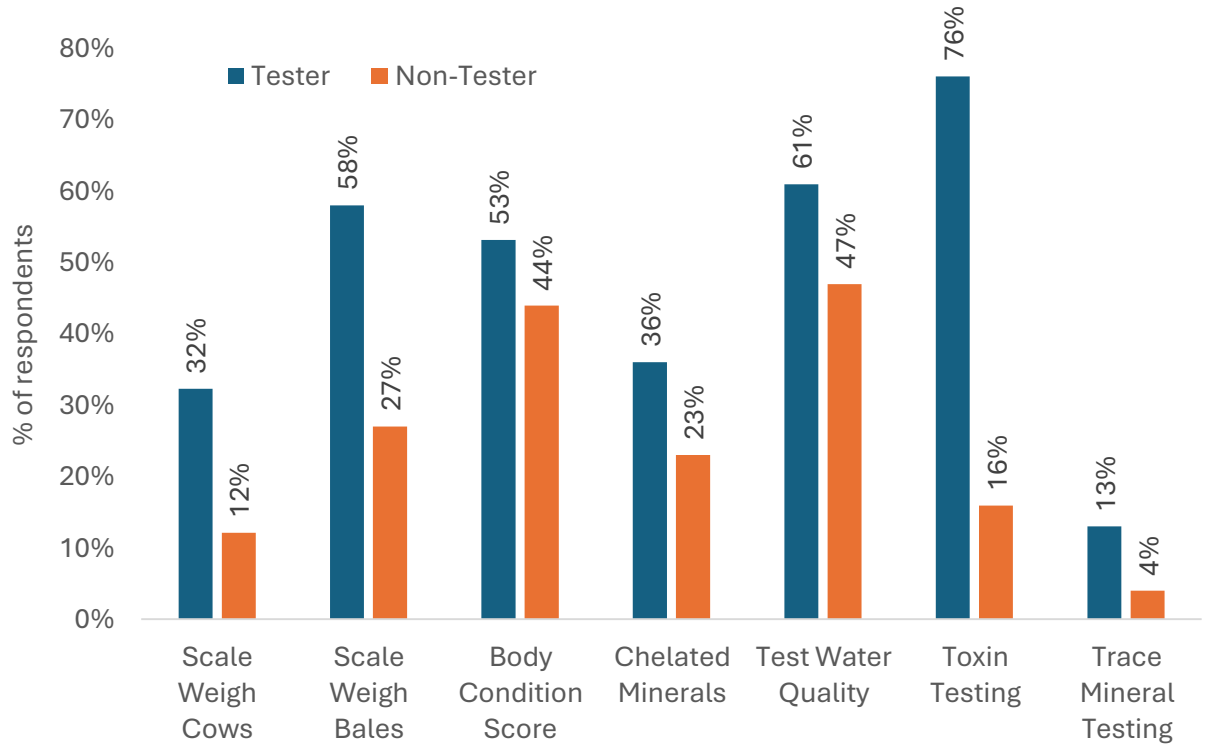


Figure 4. Adoption of Complementary Practices: Feed Tester (n=192) vs Non-Tester (n=132)

Attributes and Practices Associated with Feed Testing

The survey sample included 192 cow-calf producers in Western Canada who identified as feed testers (i.e. tested at least one feed in the last 3 yr). We analyzed the association between 16 attributes of the ranch/rancher and the probability of feed testing. Within our survey sample, producers with over 250 cows were 24% more likely to feed test compared to producers with less than 100 cows (P=0.005), those with retained ownership were 18%

more likely to feed test (*P*=0.0003), and those who their weighed bales were 18% more likely to feed test (*P* = 0.0004). With retained ownership a producer needs to be mindful of which feeds and in which amounts are used for each class of livestock to meet production targets. Bale weights provide producers with more precision of their feed inventory which is coupled with feed test results to develop rations.

Respondents who had off-farm income (P=0.054) and used mixer wagons (*P*=0.06) had positive trending (*P<0.10)* associations with feed testing. The variables that did not have a meaningful association with a producer feed testing were: age, province, post-secondary education, 10 yr plan to exit the industry, high reliance on beef sales, body condition scoring, weighing cows on a scale, years of experience, and risk tolerance. This does not imply that these variables are not important, however, they did not have a statistically significant association within our survey sample.

Lab method, test method, and ration balancing among respondents

In the survey, those who feed tested were asked about sample collection, their choice of lab and test method for feed testing, ration balancing and the use of third parties (e.g. extension specialists, feed companies, consulting nutritionists).

Sample Collection

The majority of feed testers (63%) collect samples of their feed for testing while 37% rely on third parties. Some consulting nutritionists may prefer to do the sample collection so they can ensure a representative sample is taken. Most sampling is done just prior to feeding (which follows recommended practice).

Forage probes are commonly used to collect samples. About one third of feed testers (58/170) own a forage probe, 40% borrow a probe and 11% let a third party collect the sample. Grab samples can be used for sampling silage from a pit, but should not be used to collect samples from baled forage.

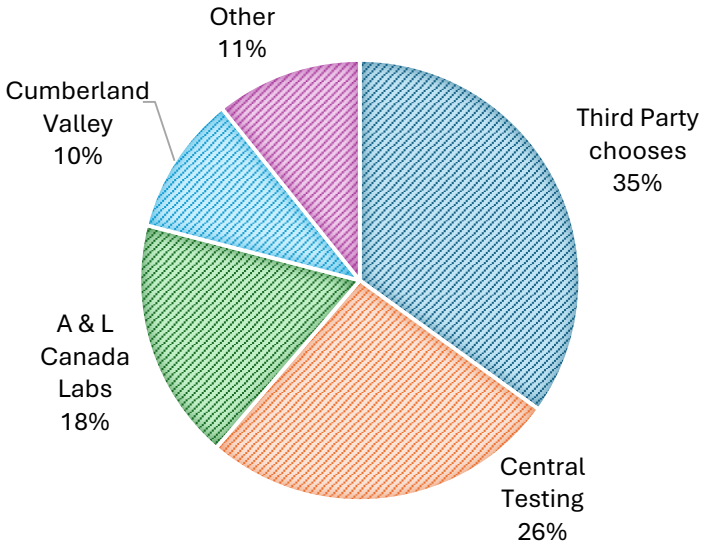


Figure 5. Which lab do you typically send feed samples to? (n=192)

Lab & Test Method

Feed testers were asked which lab they most commonly send samples to for testing. The majority of respondents (35%)

were not sure which lab was used because a third party handled lab and test package selection. Similarly, 49% let a third party pick the test method (e.g. wet chemistry, NIR) and test package (e.g. FD2 at A&L or 2FF at Central). Among those who did know, the most common lab used was Central Testing (26%) and wet chemistry and NIR test methods were selected nearly equally (17% vs 16%).

Ration Balancing

Sixty-one percent of feed testers rely on a third party to use their feed test results for ration development (Figure 6) with 27% having ration development provided as a service through the feed company they deal with, 16% utilizing a paid consulting nutritionist, 14% using extension specialists and 4% using a service provided through their veterinary clinic. Among the 26% who develop rations on their own the majority (20/49) use CowBytes.

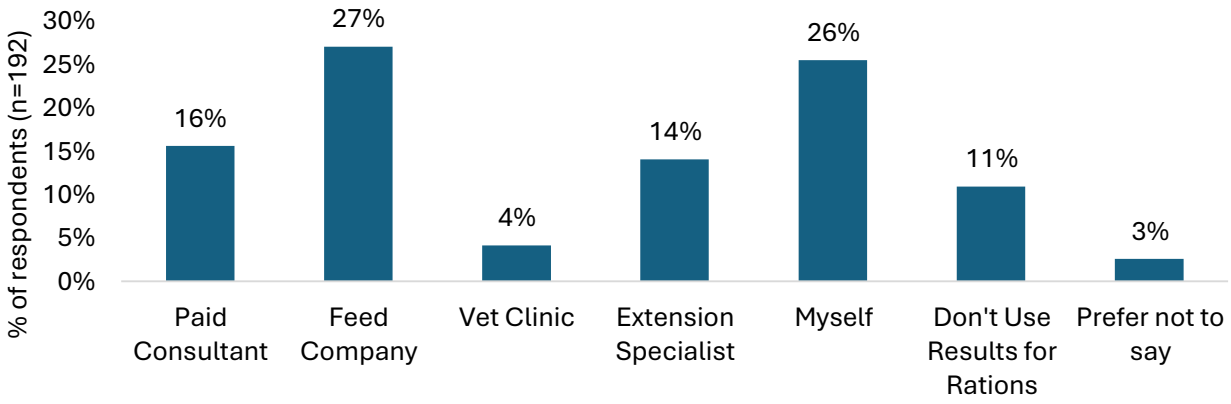


Figure 6. Percent of feed testers by provider of ration development (n=192)

The reliance on third parties for sample collection, submission and interpretation is not surprising. Producers often report a lack of time as a limiting factor for recommended practice adoption plus balancing rations requires training and expertise that producers may prefer to outsource, much like hiring an agronomist to soil test and provide advice on fertilization.

Funding Acknowledgement

Financial support for the feed testing project was received from the Beef Cattle Research Council, the Saskatchewan Ministry of Agriculture and the Canadian Agriculture Partnership.

Table 1. Tips and Links for some of the key steps in feed testing

Collecting Samples	*Lab Selection*	*Test Package*	*Interpreting Results*
Use a forage probe (e.g. Star Quality Samplers) to obtain representative sample	There are many feed testing labs to choose from	Each lab has its own test package codes & submission forms	Feed test results have 'As Fed' (moisture included) and 'Dry Matter' values; use dry matter values for ration balancing
Hay: Core 10% of bales from each lot /field; Mix cores in a pail then fill a large, clean resealable bag labelled with your name, feed type, lot/field **Silage:** sample >4 wk after ensiling or as it is being put in pit; squeeze out air from bag before sealing sample and keep cool/out of sun or freeze until ready to ship	**Toxin testing & trace mineral testing:** offered at Prairie Diagnostic Services (Saskatoon)	**Wet chemistry:** higher cost, but considered the gold standard **NIR/Near infrared reflectance spectroscopy:** cheaper and faster, but less accurate for minerals or mixed feeds (e.g. pea-oat)	**Single Feed Evaluation Tool**: uses 7 values from a feed test to quickly assess the suitability of a single feed (beefresearch.ca/feedtest) **Cowbytes:** purchase for $60 from BCRC (cowbytes.ca) to build rations from feed test results
YouTube Video on sample collection by SK Agriculture	Samples should be shipped to labs using 2-d shipping; Ship silage samples on ice (e.g. frozen water bottles)	Nitrate testing is recommended for stressed feed (drought, frost, hail) or heavily N-fertilized forages	YouTube Video tutorials on CowBytes by SK Agriculture
Webpage with sampling tips and graphics by BCRC	Results from wet chemistry are typically received in 8-11 d	pH testing is recommended for silage (want below 5, ideally 3.8-4.2)	Fact sheet explaining the different values reported on a feed test by Alberta Agriculture
Fact Sheet on Feed Sampling and Analysis by SK Agriculture Recommended Principles for Proper Hay Sampling (D Putnam, UC Davis)	Survey respondents commonly used: Central Testing (MB) A&L Canada (ON) Down to Earth (AB) Cumberland (BC/US)	Comprehensive wet chemistry tests: Central Testing – 2FF A&L Canada – FD2 Down to Earth – FD14 Cumberland - Standard	Beef Cattle Research Council explains lab test results and typical ranges at beefresearch.ca/tools/feed-testing-analysis-for-beef-cattle/