



The 2017 Statistics Canada Farm Management Survey (FMS) provides a comprehensive insight into Canadian agricultural production and how agriculture is changing. The industry continues to work toward increasing productivity; while remaining environmentally and economically sustainable. The detailed data gathered by the 2017 FMS offers insight into how operators are adapting to a changing market environment and to economic pressures around production practices.

I. Management Practices

Animal Performance

The 2017 FMS found that the average weight of cow by stage of life were relatively low compared to the 2013 Western Canadian Cow-Calf Survey (WCCCS) with the average calf at birth weighing 77 (lbs), the average weaning weighing 523 (lbs) and the average mature cow weighing 1256 (lbs).

Table 1. Provincial breakdown of birth weight, weaning weight, cow weight, weaning weight as a percentage of mature cow weight¹ and weaning rate for heifers and cows²

	Calf Weight (Lbs)	Weaning Weight (lbs)	Adjusted 205 day weaning weight (lbs)	Mature Cow weight (lbs)	205 ww as % of Cow wgt	Weaning Rate - Heifers	Weaning Rate - Heifers
Canada	77	523	539	1,256	43%	72%	81%
Ontario	70	465	518	1,196	43%	56%	74%
Manitoba	77	515	523	1,266	41%	72%	82%
Saskatchewan	81	543	551	1,299	42%	76%	83%
Alberta	78	534	545	1,249	44%	76%	82%
British Columbia	74	524	537	1,204	45%	74%	83%

¹ Data points on weight were collected by asking respondents for the average weight of their cows at different stages of life and then calculating the average from those weights.

² Data points were collected by asking respondents for the average weaned success rate of their cows and then calculating the average from those averages

Source: Statistics Canada, Farm Management Survey, 2017.

The weaned success rate or the number of weaned calves per number of heifers or cows reported varied by province. The FMS reported that the rate was 72% for first calf heifers and 81% for all other cows in Canada. Alberta and Saskatchewan had the highest weaned success rate for first calf heifers (76%). The success rate for all other cows was relatively constant with Ontario having the lowest success rate (74%) out of all the provinces. In comparison, Manitoba, Saskatchewan, Alberta, and British Columbia ranged from 82% to 83%. The FMS 2017 numbers provide an interesting benchmark for future research.

Feeding Practices

Data gathered on production practices by the FMS provides some detail into various management practices although the FMS does not distinguish between different types of beef cattle operations such as cow/calf or feedlot. While there are variations between provinces, the FMS data does show some similarities particularly in terms of the types of inputs being utilized by producers. An estimated 72% of beef cattle operations in Canada supplement with grain-based feed grown on the operation.

Table 2. **Provincial breakdown of beef cattle operations that consumed grain-based feed grown on operation**

% of beef cattle operations ¹	Yes	No
Canada	72	28
Ontario	65	35
Manitoba	72	28
Saskatchewan	76	24
Alberta	74	26
British Columbia	41	59

¹ Figures expressed as a percentage of total operations reporting beef cattle that also reported feeding grain-based feed
 Source: Statistics Canada, Farm Management Survey, 2017.

Corn silage makes up 5% of the average beef cattle forage feed ration. In comparison, silage, green feed or hay makes up 41% of the beef cattle forage feed ration in Canada and legumes 19%.

Table 3. **Average percentage of beef cattle forage feed ration**

% of feed ration by weight ¹	Corn silage	Other field crop silage, greenfeed or hay ²	Grasses ³	Legumes ⁴	All other sources of forages
Canada	5	41	28	19	7
Ontario	9	37	32	16	F
Manitoba	8	45	17	19	F
Saskatchewan	X	46	23	20	X
Alberta	X	41	30	21	F
British Columbia	X	24	48	24	X

¹ Respondents reported percentages based on actual weight

² Other field crop silage, greenfeed or hay includes cereals, oilseeds, pulses

³ Grasses include timothy, fescues, wheat grasses, rye grasses, orchard grass

⁴ Legumes include alfalfa, clover, sainfoin, trefoil, vetches

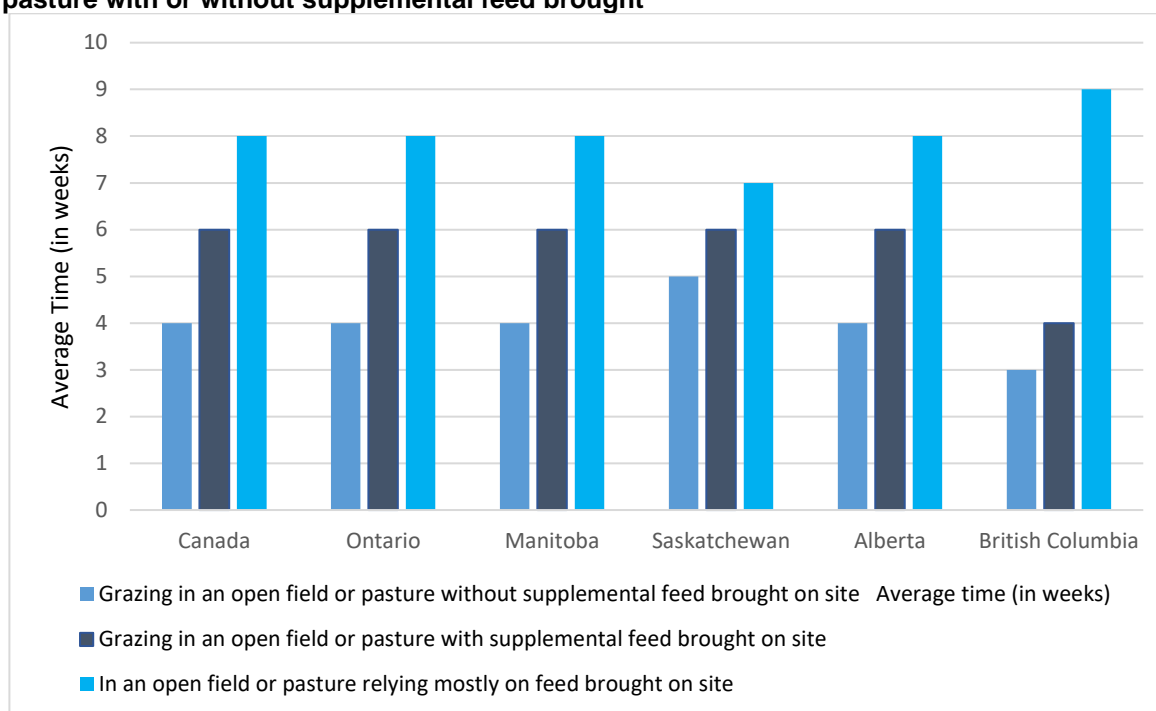
Source: Statistics Canada, Farm Management Survey, 2017.

The FMS provides detailed information on feeding practices both in terms of what is being fed and when this feed is being provided by producers. Table 3 above shows the proportion of different forages (hay, silage and green feed) used in the ration by province. What makes up beef cattle ration varies across Canada, reflecting differences in production systems and feed availability. The cost and availability of feed has significant implications for producer profitability as well as for the economic sustainability and competitiveness of the industry.

Extended Grazing

Extending the grazing season into the winter months is one approach producers can take to reduce feed costs while also putting nutrients back into the soil. On average, as shown in Figure 1, the time beef cattle operations grazed their cattle during the winter season in an open field or pasture without supplemental feed brought to them was four weeks in Canada (see Figure 1). The average increased in examples of an open field or pasture where cattle relied on feed brought on site to 8 weeks. In Alberta, Ontario and Manitoba the average was 8 weeks. In British Columbia the average grazing time without supplemental feed was 9 weeks and 7 weeks in Saskatchewan. The FMS results do not, unfortunately, do a sector breakdown focusing with questions related only to cow-calf and to feedlot operations which we would expect to have very different approaches to winter feeding.

Figure 1. Provincial breakdown of average grazing time during winter months in an open field or pasture with or without supplemental feed brought



Source: Statistics Canada, Farm Management Survey, 2017.

Information on the different winter forages utilized by producers by province is provided. The FMS 2017 data shows variations between provinces in the types of vegetation that were grazed by beef cattle operations over the winter months. In Alberta, an estimated 47% of operations relied on residues or the aftermath growth from harvested field crops (ex. Stubble, straw, chaff, volunteer crop and weed growth) and 29% of operations grazed swathed or windrowed crops. For British Columbia the FMS 2017 found that 53% of operations grazed cattle on residues. In Saskatchewan, however, the FMS found that 17% of operations reported that they grazed cattle on standing corn. Using standing corn can help take the pressure off grazing pasture land and allow for the stockpiling of grasses while also reducing labour and machinery costs during winter feeding. While the potential of standing corn as a feed source for cattle has been put forward, it is traditionally a cash crop in provinces such as Manitoba. It will be interesting to see if the number of producers utilizing standing corn increases in future data collection efforts.

Table 4. Provincial breakdown of types of vegetation grazed after November 2017^{1,2}

	Cattle were grazed after November 2017 ³	Residues or aftermath growth from harvested field crops ⁴	Swathed, cut or windrowed crops ⁵	Standing corn	Other standing dormant vegetation	Other type of vegetation ⁶
% of operations						
Canada	68	43	19	15	27	33
Ontario	43	31	X	X	F	59
Manitoba	67	34	X	X	30	33
Saskatchewan	76	43	15	17	26	35
Alberta	75	47	29	14	28	26
British Columbia	72	53	X	X	34	38

¹ Respondents were asked to select all vegetations that were grazed after November 2017.

² The sum of the operations reporting each vegetation types grazed by beef cattle is greater than the total because an operation may report multiple vegetation types.

³ Beef cattle operations having grazed their cattle after November 2017 in an open field or pasture without relying mostly on feed brought on site.

⁴ Residues or aftermath growth from harvested field crops includes stubble, straw, chaff, volunteer crop and weed growth.

⁵ Examples of swathed, cut or windrowed crops includes swath grazing.

⁶ Examples of other standing dormant vegetation include stockpiled forages, cover crops.

Source: Statistics Canada, Farm Management Survey, 2017.

While each operation might differ in their specific approaches to winter grazing, the FMS found that producers reported supplementing their livestock in order to keep them in proper condition while turned out in an open field or pasture. There was some variation in the methods used to provide supplemental feed. Some producers favoured whole bales of hay or straw (49%) and others unrolled bales of hay or straw (38%). Processed hay, silage or straw fed on the ground in a windrow was brought on site in Manitoba (50%), Saskatchewan (45%) and Alberta (51%). However, processed hay, silage or straw fed in a trough was also utilized with 18% of operations using this approach, 13% in Manitoba, 10% in Saskatchewan, 15% in Alberta and 9% in British Columbia.

Table 5. Provincial breakdown of type of feed provided during winter grazing months¹

% of beef cattle operations	Whole bales of hay or straw ²	Unrolled bales of hay or straw	Processed hay, silage or straw fed on the ground in a windrow or pile	Processed hay, silage or straw fed in a trough	Grain or other supplements
Canada	49	38	43	13	28
Ontario	72	22	X	18	24
Manitoba	56	46	50	13	27
Saskatchewan	52	39	45	10	33
Alberta	38	39	51	15	28
British Columbia	45	44	X	9	12

¹ Beef cattle operations having grazed their cattle in an open field or pasture with or without supplemental feed brought on site.

² Examples of whole bales of hay or straw were bale grazing.

Source: Statistics Canada, Farm Management Survey, 2017.

There are positive and negatives to each of these feeding methods. While the end goal for any producer is to minimize feed costs and wastage, no feeding system is perfect. The use of a trough to provide supplemental feed in Ontario is interesting because it is one of the best ways to minimize feed wastage by limiting the ability of cattle to trample and soil any supplemental feed. In comparison, feeding large round bales in a pasture area can result in high feeding losses as cattle trample and soil it. However, unrolling large round bales and feeding on the ground allows producers to move the feeding areas around the pasture and distribute manure and nutrients more evenly. If troughs are not moved regularly this may impact forage growth during the next growing season and may cause manure to accumulate unevenly.

The FMS provides details on producer usage of grain or other supplements. The use of grain and other supplements can help stretch forages while also increasing nutrients like protein. FMS found that 28% of producers supplement with grain or some other supplement. Saskatchewan had the highest use of this type of feed with 33% of producers feeding cattle in an open field or pasture used grain or other supplements. Alberta followed with 28% of producers reporting the use of grain or other supplements, 27% in Manitoba, 25% in Ontario and 12% in British Columbia.

The use of these supplements helps identify a fundamental trade off in the beef industry. Cattle can play an integral role in protecting grasslands and keeping them healthy. Well managed grazing programs not only help sequester carbon in marginal lands that may not be suitable for human food crop production but preserve open space and wildlife habitat. However, cattle are often supplemented with grain or other supplements which take material and energy resources to be grown. If not done in a sustainable way, beef operations can have negative impacts on the environment.

II. Sustainability

In discussions over food security and climate change, livestock production is highlighted as a contributing factor to greenhouse gas emissions. While beef operations do contribute to greenhouse gas emissions, they can also play a key role in reducing emissions and preserving what remains of the Canadian prairies. Producers are increasingly trying to implement sustainable and conservation orientated production practices while also balancing the need to run a profitable and productive enterprise. The goal to be both sustainable and profitable is not mutually exclusive. Equipped with new tools and research, there are efforts to make the industry more productive while preserving resources for future generations. The information provided in FMS helps to inform where environmental risks may occur and potential ways in which beef production can help to maintain and restore grasslands, an essential store of carbon and habitat to many species across Canada. All things require balance, grassland management included. Beef producers have made significant efforts to find this balance.

Canadian cattle producers play an important role as stewards of grassland even as they rely on this resource as an important feed input. When grassland is utilized in a responsible and sustainable way, beef production can help preserve and maintain healthy native rangelands and the associated biodiversity. Well managed grasslands can sequester carbon in the grasses and soil of perennial rangelands. As shown in Table 6 below, in the province of Saskatchewan the FMS finds that 43% of the species composition of most commonly grazed paddock was mostly native grasses and in Alberta this number was 44%. Interestingly, 61% of the species composition of the most commonly grazed paddock in Manitoba was mostly native grass. This percentage seems relatively high and this might be due to the survey collection method which weights areas that have a high beef cattle operation concentration and, therefore, have more native grassland that has not been plowed.

Table 6. Breakdown by province of species composition of most commonly grazed paddock¹

% of beef cattle operations ²	Mostly native grasses	Mostly tame grasses	Mixture of tame grasses and legumes	Cereal or cover crops ³	Other composition
Canada	43	21	27	F	4
Ontario	28	26	36	X	X
Manitoba	61	8	20	X	6
Saskatchewan	43	21	28	0	6
Alberta	44	23	26	X	3
British Columbia	45	17	29	X	X

¹Refers to the paddock used primarily for grazing between April and October 2017 by the most common grazing beef cattle on the operation

²Figures expressed as a percentage of beef cattle operations with land for pasture

³Examples of cereal crops include barley, oats and rye.

Source: Statistics Canada, Farm Management Survey, 2017.

The FMS finds that, overall, the data gathered on the percentage of cereal or cover crops in the most commonly grazed paddock in Canada is too unreliable to be published. For Ontario, Manitoba, Alberta and British Columbia the data was suppressed in order to meet the confidentiality requirements of the *Statistics Act*. In Saskatchewan the data was either a true zero or a value rounded to zero.

Grazing Management

Managing forage resources for the medium and long term by preventing overgrazing and soil degradation is key. Soil that is productive and health grows more plants and adds weight to grazing animals who, in turn, add more soil organic matter and improved water-holding capacity through manure and grazing activity. As illustrated below in Table 7, the FMS found that the majority of producers used a paddock two times in a single grazing period (April to October).

Table 7. Number of times paddock was used for grazing^{1,2}

% of beef cattle operations	One time	Two times	Three times	Four times	Five or more times
Canada	28	33	20	6	11
Ontario	10	15	30	11	33
Manitoba	14	40	24	12	9
Saskatchewan	36	37	16	X	8
Alberta	33	35	19	5	7
British Columbia	34	34	16	X	9

¹Refers to the paddock used primarily for grazing between April and October 2017 by the most common grazing beef cattle on the operation.

²Figures expressed as a percentage of the total beef cattle operations with land for pasture.

³Beef cattle kept in the same paddock had access to the whole paddock for the entire grazing season.

Source: Statistics Canada, Farm Management Survey, 2017.

While the number of times pasture is used for grazing is important to know, the intensity which producers graze an area can have significant impacts on the overall health of the grass. The long-term sustainability of forage-based beef operations is influenced by the intensity of management. Table 8 below shows that 28% of beef operations in Canada keep their cattle in the same paddock for the grazing period identified by the FMS (April to October). This may reflect the management practices used on native stands.

Table 8. Provincial breakdown of length of grazing time in a pasture by week and month¹

% of beef cattle operations	Less than three days	Three days to less than a week	One week to less than two weeks	Two weeks to less than a month	One month to less than two months	Two months or more	Beef cattle kept in the same paddock ²
Canada	4	5	11	18	17	13	28
Ontario	8	10	17	11	10	8	26
Manitoba	1	X	11	24	15	12	27
Saskatchewan	F	5	8	15	18	15	33
Alberta	3	4	10	20	18	15	25
British Columbia	8	X	9	19	19	10	30

¹Refers to the paddock used primarily for grazing between April and October 2017 by the most common grazing beef cattle on the operation.

²Beef cattle kept in the same paddock had access to the whole paddock for the entire grazing season.

Source: Statistics Canada, Farm Management Survey, 2017.

As discussed above in relation to Table 8, the optimal grazing time and intensity may vary depending on the type of pasture land cattle are grazing and the grassland management approach that is being utilized. Producers are increasingly turning to different fencing and grazing approaches in order to achieve optimal grazing pressure and increase flexibility in pasture management. As illustrated in Table 9, the FMS 2017 found that 42% of beef cattle operations in Ontario used mobile electric fencing to achieve optimal grazing pressure. Mobile electric fencing usage was slightly lower in Manitoba (35%), Alberta (35%), Saskatchewan (34%) and British Columbia (29%).

Table 9. Provincial breakdown of practices used on pasture land to improve grazing distribution¹

% of beef cattle operations ²	Mobile electric fencing	Strategic placement of salt, minerals, water sources	Shade or shelter	Moved beef cattle to different areas within a large field	Other practice	No practices were used

Canada	35	58	36	56	13	10
Ontario	42	42	44	50	9	14
Manitoba	35	52	44	64	15	7
Saskatchewan	34	61	36	51	12	9
Alberta	35	62	32	59	13	10
British Columbia	29	69	20	55	15	6

¹ Respondents were asked to include all land used by this operation, i.e., owned, rented, leased or crop-shared and to exclude any land rented or crop-shared to others

² Figures expressed as a percentage of the total operations reporting beef cattle operations with land for pasture. May report using more than one practice.

Source: Statistics Canada, Farm Management Survey, 2017

Companion Crops

Building on the themes of diversity and flexibility in management practices discussed above, there is increasing interest in companion crops and their potential to improve soil quality. While the FMS finds that 8% of field crop operations used companion crops, this concept is an interesting twist on cover cropping. Companion crops are used in other countries and have been used by producers in some regions in Canada where growers may choose to plant lentils and canola together. As field operations look for new and innovative practices, it will be interesting to see whether or not more operations adopt companion crops.

Table 10. Provincial breakdown of companion crop, fall or winter cover crops and green manure group usage by field crop operations

% of field crop operations ¹	Used companion crops ²	Did not use companion crops	Used fall or winter cover crops ^{3,4,5}	Did not use fall or winter cover crops	Used green manure crops ⁶	Did not use green manure crops
Canada	8	92	13	87	10	90
Quebec	17	83	19	81	27	73
Ontario	14	86	33	67	19	81
Manitoba	4	96	4	96	X	X
Saskatchewan	3	97	F	99	2	98
Alberta	4	96	2	98	X	X

¹ Figures expressed as a percentage of total field crop operations

² Includes intercropping where both are seeded at the same time, as well as relay cropping where the second crop is seeded later between the rows of an existing crop

³ Fall and winter crops include fall seeded crops that are grazed or harvested for forage in the spring prior to reseeded.

⁴ Fall and winter crops exclude fall seeded crops that are harvested for gain, e.g., fall rye or winter wheat.

⁵ Cover crops are crops seeded in late summer or fall providing overwinter vegetative cover. Growth is terminated in spring to allow planting of the next year's crop.

⁶ Green manure crops are crops seeded in spring or early summer, whose growth is terminated before maturity, with all crop biomass incorporated into the soil.

Source: Statistics Canada, Farm Management Survey, 2017

As shown in Table 10 above, another interesting finding by the FMS was related to the use of cover crops by field operations. This method can help prevent soil erosion, increase water infiltration and grow biomass. Interestingly, the FMS reports that only 13% of field crop operations used fall or winter cover crops on field crop operations as a way of providing overwinter vegetative cover. The FMS found that 10% of operations used green manure crops that are seeded in spring or early summer – defined by the FMS as being when crop biomass is incorporated into the soil before maturity - in Canada in 2017. The majority of operations using green manure were located in Quebec (27%) and Ontario (19%).

Water Management

Conversations about the role the beef industry plays in preserving and protecting Canadian watersheds for future generations have gained traction in recent years. While beef production management practices have

the potential to impact water quality, just as important are the ways in which water quality impact the health and wellbeing of livestock. Maintaining and improving water quality is an essential component of sustainable beef production.

Keeping livestock adjacent to surface water can contribute not only to environmental problems, but to herd health concerns due to increased exposure to water transmitted diseases. The FMS finds that 72% of operations reported that livestock had unlimited access to surface water. However, producers also reported a number of different approaches used for restricting access to surface water (see Table 11). The two most commonly used methods are fencing along shoreline (71%) and remote or offsite water systems (54%). Producers also used limited or controlled grazing in riparian areas or adjacent to surface water to reduce livestock access to surface water (36%). Additionally, 39% of beef operations in Canada placed feeding or bedding sites away from surface water.

Table 11. **Methods used to restrict access to surface water by beef cattle operations**

% of beef cattle operations ¹	Fencing along shoreline	Remote or offsite water system to a trough	Access ramps for direct watering	Stream crossings	Limited or controlled grazing in riparian areas or adjacent to surface water	Feeding or bedding sites located away from water bodies	Other
Canada	71	54	14	18	36	39	7
Ontario	73	45	X	34	51	44	X
Manitoba	38	64	X	15	36	40	X
Saskatchewan	71	44	X	18	30	32	X
Alberta	76	61	12	12	35	40	7
British Columbia	77	46	19	30	33	35	X

¹ Figures expressed as a percentage of beef cattle operations where livestock had limited to no access to surface water
Source: Statistics Canada, Farm Management Survey, 2017

Water contamination is also touched on by the FMS in a set of questions related to field crop production systems. Field crop operations which maintained a buffer such as an area of planted or natural vegetation between a permanent wetland or waterway and crop land was 70% for Canada. Quebec led with 88% of field crop operations maintaining a buffer. Saskatchewan, however, had the highest number of field crop operations which did not maintain a buffer (40%). The average width between permanent wetlands or waterways and cropland in Canada was three to less than seven meters.

Table 12. **Width of buffer maintained between permanent wetlands or waterways and cropland by field crop operations¹**

% of field crop operations ²	Less than three meters / less than 10 feet	Three to less than seven meters / 10 to less than 20 feet	Seven to less than twelve meters / 20 to less than 40 feet	Twelve to less than twenty-four meters / 40 to less than 80 feet	More than twenty-four meters / more than 80 feet
Canada	17	36	20	13	13
Quebec	39	48	9	X	F
Ontario	18	39	22	10	9
Manitoba	F	22	21	X	29
Saskatchewan	10	26	26	20	18
Alberta	6	38	20	18	17

¹ A buffer refers to an area of planted or natural vegetation that is beside a permanent wetland or waterway, extending from the shoreline to the edge of the field

² Figures expressed as a percentage of total field crop operations with buffer maintained between permanent wetlands or waterways and cropland

Source: Statistics Canada, Farm Management Survey, 2017

This data provides insight into the practices of field crop operations and how best to encourage the protection of surface water sources and wetlands. Identifying the importance of water quality and the best management practices for preserving this resource link back to the role producers play in preserving natural resources. For example, land use decisions which convert lands and soils from cropland to pasture or forage production as well as efforts to prevent run-off from croplands by maintaining a buffer zone can have positive benefits for water quality.

While winter grazing is discussed above, properly managed wintering are important for reducing the risk of runoff and seepage. Not only does a correctly managed winter grazing program reduce water contamination, but, as noted before, it can help producers mitigate the cost from the buildup of manure and bedding. For cattle grazed or fed in an open field, 16% of producers fed in the same location for the entire winter, 41% of producers fed several times in the same location before moving and 39% of producers fed only once in a location before moving. See Table 13 for a provincial breakdown of winter feed location practices.

Table 13. Provincial breakdown of how often winter feed locations are moved

% of beef cattle operations ¹	Feed was provided in the same location for the entire winter feeding season	Feed was provided several times in the same location and then moved to a different location	Feed was provided only once in the same location, with subsequent feedings always in a new location	Other placement	Every year	Every two years	Every three to five years
Canada	16	41	39	4	76	14	10
Ontario	40	37	X	X	87	X	X
Manitoba	14	38	X	X	83	X	X
Saskatchewan	16	39	41	5	73	19	7
Alberta	11	43	42	3	72	13	15
British Columbia	12	48	35	5	82	9	8

¹ Figures expressed as a percentage of operations with beef cattle that grazed or fed in an open pasture.

Source: Statistics Canada, Farm Management Survey, 2017

Fertilizer and Manure

Grazing systems may utilize external inputs including supplemental fertilizer and manure. While they can be beneficial and positively impact the productivity of an operation, these external inputs may also pose their own environmental risks depending on how they are used by an operation. The FMS provides insight into how producers may be addressing crop nutrient requirements, runoff and how to apply external inputs such as manure. For example, Table 14 below shows the practices used to maintain pasture land by beef cattle operations. Different practices for managing and maintaining pasture land highlighted by the FMS include: irrigation (4%), applied fertilizer (20%), applied manure (37%) and the removal of tress or controlled weeds (23%) were also used.

Table 14. **Distribution of beef cattle operations (in percentage) by practices used on pasture land of beef cattle operations**

% of beef cattle operations ¹	Applied fertilizer	Applied manure	Removed trees, controlled weeds or brush	Also used land for hay or silage	Reseeded for pasture use	Broke up pasture to convert to crop production
Canada	20	37	23	32	16	13
Ontario	34	54	33	30	26	15
Manitoba	17	37	17	34	8	10
Saskatchewan	13	33	11	30	15	12
Alberta	19	35	29	34	15	14
British Columbia	33	27	35	39	23	8

¹Figures expressed as a percentage of the total beef cattle operations with land for pasture.

Source: Statistics Canada, Farm Management Survey, 2017

Eastern beef cattle operations in Ontario favoured manure as a pastureland management tool (54%). In comparison, 27% of British Columbian, 35% of Albertan, 33% of Saskatchewan and 37% of Manitoban beef operations used manure on pasture land. This is impacted by the larger land base in western Canada, diluting the percentage and weather conditions in eastern Canada that make it more conducive. Ontario also had the highest use of applied fertilizer usage out of the reported provinces (33%). It is important to note that operations did report the use of more than one practice.

While these numbers provide insight into what pasture management practices are favoured and where, just as critical is understanding the way in which they are being applied and if producers are taking into account nutrient requirements when making these decisions. The FMS found that 39% of beef cattle operations applied solid manure to land prior to seeding forage crops but the majority (61%) did not apply prior to seeding. Instead, FMS found 59 percent of total solid manure spread on field crops was spread between October to December 2016 and only 22 percent from April to June 2017.

Table 15. **Provincial breakdown of manure application to field and forage crops by period**

% of beef cattle operations ¹	October to December 2016 ²	January to March 2017	April to June 2017	July to September 2017	October to December 2016 ³	January to March 2017	April to June 2017	July to September 2017
Canada	36	4	29	31	59	2	22	18
Ontario	30	x	34	32	x	F	39	19
Manitoba	31	x	18	50	53	0	x	31
Saskatchewan	48	x	21	27	67	x	17	x
Alberta	41	x	29	27	65	x	20	15
British Columbia	24	14	48	15	x	0	x	x

¹Refers to the average of the percentage of solid manure spread on field crops and forage crops during each period reported by beef operations with mostly solid manure stored to applied to cropland

² Solid manure spread on forage crops during each reported period.

³ Solid manure spread on field crops during each reported period

Source: Statistics Canada, Farm Management Survey, 2017

This is interesting given that, ideally, nutrients should be added to the soil when uptake is the highest – typically just before growth in the spring. However, the FMS does report that the majority of beef cattle operations (76%) which use solid manure to grow field do broadcast manure on surface and work it into the soil.

Table 16. **Application of solid manure**

% of beef cattle operations ¹	Broadcast on surface and not worked into the soil	Broadcast on surface and worked into the soil
Canada	31	76
Ontario	24	89
Manitoba	x	87
Saskatchewan	41	x
Alberta	34	72
British Columbia	X	x

¹Figures expressed as a percentage of total beef operations with mostly solid manure stored or applied to cropland and where field croplands received more manure than forage croplands

Source: Statistics Canada, Farm Management Survey, 2017

Nutrient testing provides valuable information for producers on how best to maximize productivity while also reducing the risk to the environment. For example, application rates of manure should be chosen based on the nutrient composition of the area and soil needs. However, the FMS reports that relatively few cattle operations test solid manure for nutrient content either on field or on forage. The FMS reports that 85% of the Canadian beef cattle operations surveyed do not test solid manure for nutrient content on field and that 90% of the beef cattle operations do not test solid manure nutrient content on forage. See Table 17 below.

Table 17. **Manure Testing**

% of beef cattle operations ¹	Every year ²	Every two to three years	Every four to five years	Do not test solid manure	Every year ³	Every two to three years	Every four to five years	Do not test solid manure
Canada	F	F	1	90	6	4	3	85
Ontario	x	x	X	90	6	F	x	x
Manitoba	x	x	X	82	x	x	x	82
Saskatchewan	x	x	0	94	x	x	x	93
Alberta	x	x	X	89	10	3	F	82
British Columbia	0	x	X	85	0	0	0	x

¹ Figures expressed as a percentage of total beef operations with mostly solid manure stored or applied to either forage cropland or field cropland

² Frequency that solid manure is tested for nutrient content on forage

³ Frequency that solid manure is tested for nutrient content on field crops

Source: Statistics Canada, Farm Management Survey, 2017

Shelterbelts

Shelterbelts, like cover crops, can help protect against erosion and as well as provide cattle with shelter. Natural shelterbelts not only don't require any investment in labour costs due to planting but have the added bonus of providing habitat for a number of native species as well. Interestingly, the FMS found that 2,209 operations out of the total 14,151 (16%) planted intentional shelterbelts in field as shelter in Canada.

These findings, particularly the break down for each province, help provide additional insights on shelterbelt usage by producers. For example, a study conducted in Saskatchewan using both 2013 and 2017 landowner survey results found that there were relatively few livestock farms with shelterbelts in the province.¹ In the 2013 sample the authors found that only 21 (34%) of the 61 landowners sampled had shelterbelts in their fields or livestock yards and, in the follow-up 2017 survey, the researchers found that only 12% of the 67 landowners sampled had shelterbelts.² The authors of this particular study noted that one of the key reasons there are relatively few livestock operators planting and maintaining shelterbelts is

¹ Suren Kulshreshtha et al., "Economic–Environmental Impacts Of Shelterbelts In Saskatchewan, Canada," *Environmental Impact /V*, 2018, (<https://doi.org/10.2495/eid180251>)

² Ibid.

the opportunity cost of the land occupied by them.³ In comparison, the FMS found that 753 beef operations (17%) reported planting shelterbelts in fields as shelter for cattle.

The insights provided by the FMS – along with previous survey results and research findings related to shelterbelt use by producers – help to illuminate the impact of different policy measures such as the Prairie Shelterbelt Program. Headquartered in Saskatchewan, the Prairie Shelterbelt Program was part of a larger federal government response to the economic and environmental disaster of the early twentieth century. Although the Prairie Shelterbelt Program was ended in 2013, it did provide trees to producers for a number of uses including for farmyard, dugout, riparian area, and conservation and reclamation projects. With the ending of subsidized seedling programs it may be that we will see further decreases in the number of shelterbelts being planted by livestock operators in the prairie provinces as the opportunity cost of either maintaining natural shelterbelts or investing in new ones increase.

Table 18. Provincial breakdown on natural tree bluffs and shelterbelt planting

	Natural tree bluffs and wooded areas in field	Planted shelterbelts in field	Natural tree bluffs and wooded areas in field (%)	Planted shelterbelts in field (%)
Canada	11,576	2,209	82%	16%
Ontario	819	X	86%	X
Manitoba	1,720	382	93%	21%
Saskatchewan	3,642	753	80%	17%
Alberta	4,833	953	78%	15%
British Columbia	562	x	93%	X

Source: Statistics Canada, Farm Management Survey, 2017

III. ANIMAL HEALTH

Animal health, animal welfare and beef production management practices are tightly linked. The best methods to manage and ensure the health and welfare of livestock have come to forefront of producer and consumer discourse. Regulatory changes along with programs such as Verified Beef Production (VBP+) have been introduced to encourage the highest standards for on-farm food safety, environment, biosecurity and animal welfare. The welfare module is based on the Beef Code of Practice which was developed under the oversight of the National Farm Animal Care Council also aims to provide recommendations and requirements for animal care. This is coming at a time when consumers are more actively engaged in the topic of animal welfare and food safety.

Antibiotic Use

In 2018, regulatory changes were introduced to move a number of products into a prescription drug-use category. These new regulations came a year after the FMS was conducted in 2017 and therefore they are not reflected in its numbers. These regulations are intended to encourage cattle producers to reduce and control antimicrobial resistance through the daily management of their herds either by reducing the need for antimicrobials or, when they are needed, that they are used prudently. The FMS 2017 study found that the total number of operations who recorded using antibiotics to prevent infection outbreaks numbered 7,773 and operations which used antibiotics to treat infections numbered 16,945. Table 19 below shows that 34% of operations used antibiotics to prevent infection outbreaks and 74% of operations used antibiotics for treating infections.

³ Ibid.

Table 19. Antibiotic use by cattle producers

% of beef cattle operations ¹	Antibiotics to prevent infection outbreaks	Antibiotics for treating infections
Canada	34	74
Ontario	25	57
Manitoba	39	78
Saskatchewan	36	76
Alberta	36	78
British Columbia	26	73

¹ Figures expressed as a percentage of total beef cattle operations.

Source: Statistics Canada, Farm Management Survey, 2017

A potential area of future research could be to compare the 2017 FMS data with future data on antibiotic use by producers to see how practices have or have not changed since the 2018 regulations on certain products were introduced – particularly in relation to preventative antibiotic use. Additionally, it is important to note that this data is skewed toward cow-calf operations. It would be informative to see this data broken into feedlot and cow/calf operations.

Ionophores and Implants

Antibiotics are not the only tool available for beef operations. The FMS identifies ionophores, ear implants, Ractopamine or Zilpaterol and rumen modifiers. These different feed additives and products can help increase productivity while also maintaining animal health. Ionophores, for example, can be fed to any class of cattle and can help decrease the incidence of coccidiosis as well as bloat in cattle. Ionophores usage was highest in Alberta (9%) and lowest in British Columbia (2%). Interestingly, Ontario had the highest use of ear implants (17%) and rumen modifiers (8%). While this data does not distinguish between feedlots and cow/calf producers, these numbers are still informative. The link between animal health and welfare and consumer demand is an important one. The FMS insights help provide the foundation for future communication.

Table 20. Ionophores and implant use by beef producers

% of beef cattle operations ¹	Ionophores	Ear implants	Ractopamine or Zilpaterol	Rumen modifiers ²	Bentonite, Yeast Cell Wall, glucomannan products, or enzymes	Other product
Canada	7	14	1	7	1	17
Ontario	8	17	X	8	F	10
Manitoba	6	8	X	6	X	16
Saskatchewan	7	14	X	7	X	20
Alberta	9	14	1	6	F	17
British Columbia	2	8	X	2	X	19

¹ Figures expressed as a percentage of total beef cattle operations.

² Rumen modifiers includes yeast or yeast culture, probiotics, prebiotics.

Source: Statistics Canada, Farm Management Survey, 2017

Shelter

The FMS touches on the use of shelters in beef cattle operations. Shelters help to reduce animal maintenance requirements and allow producers to maintain or, in some cases, even improve livestock gains and body conditions. The FMS found that 33% of producers used stationary windbreaks or shelters. Portable windbreaks or shelters were utilized by 41% of operations. Portable windbreak or shelter use is interesting because these structures can be moved depending on different factors including grazing intensity. As discussed previously in regards to the use of mobile electric fence, producers are increasingly trying to make their production systems more flexible and diverse in regards to grassland management and grazing systems.

Table 21. Provincial breakdown on types of shelters

% of beef cattle operations	Natural tree bluffs and wooded areas in field	Planted shelterbelts in field	Constructed stationary windbreaks or shelters in field	Portable windbreaks or shelters, moved to different locations in field	Cattle walked to farmyard for shelter ¹	Other method
Canada	82	16	33	41	35	2
Ontario	86	x	19	x	43	0
Manitoba	93	21	36	38	43	2
Saskatchewan	80	17	32	44	38	F
Alberta	78	15	37	47	32	2
British Columbia	93	x	17	X	14	3

¹ Examples of cattle walked to farmyard for shelter includes farmstead shelterbelt, stationary windbreak, barn.

Source: Statistics Canada, Farm Management Survey, 2017.

Producers recognize that good animal health and welfare practices can increase feed efficiency and profitability, but it can also help preserve natural resources. Providing cattle with shelter from extreme weather can be achieved through the protection of natural shelterbelts and wooded areas. Out of the total number surveyed, 82% of operations relied on natural tree bluffs and wooded areas in fields. Producers can employ a naturally growing and, in some case, already existing resource thus reducing costs, improving productivity and – importantly – preserving natural habitat.

These overlapping themes of good management, sustainability and animal health help highlight how changes made to one aspect of an operation can have ripple effects not only on the profitability and sustainability of the operation but the overall health of livestock.

CONCLUSION

The FMS helps to illuminate the changing way resources are being managed and potential areas for improvement. The insights generated by the FMS provide insights that can be used to design effective and well targeted policy and program responses. It helps serve as a robust basis for discussion and the creation of roadmaps that identify realistic targets for the beef industry on a range of topics including best management practices, productivity, sustainability, biodiversity and animal welfare.

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