

Beef and Forage Technical Bulletin 8th Edition



Keeping Your Beef Cows Fueled Up! Energy Requirements and Feed Quality

When planning for fall and winter feeding, a good first step is to take an inventory of all the feeds you have on hand. Then, at minimum, have the feeds tested for energy (TDN), crude protein (CP), calcium (Ca) and phosphorous (P). That way, you can match the feed quality to your cows' needs as they progress through the winter and stages of production.

Energy is the first limiting factor for proper nutrition. Without enough energy, the cow will not be able to maintain her current body weight and will not be able to meet her full potential for reproduction and lactation. The amount of energy required depends on breed, body condition score, weight, expected average daily gain, feed additives (such as rumensin), temperature, wind speed, hide thickness, hair length and cleanliness.

In beef nutrition, we commonly express the 'energy' of a feed as total digestible nutrients (TDN %). TDN is the sum of the digestible fibre, protein, fat and carbohydrate of a feed. It is directly related to digestible energy (DE). DE is the total energy in the feed minus what is not digestible or expelled as feces.

A cow's energy requirements will vary throughout her yearly production cycle. In Table 1, the requirements for a 1,350 lb. mature beef cow that calves in May were estimated using long-term average Manitoba weather conditions. It's a good idea to save the best quality feeds for after calving, especially since peak milk yield generally occurs two months post-calving and requires the most energy. Otherwise, you will have to supplement with more grain or another concentrate feed. The lowest energy requirements for a beef cow occurs when she is dry and in early gestation.

Table 1. Recommended values of Dry Matter Intake (DMI), TDN and CP for a 1,350 lb. mature beef cow – under Manitoba conditions¹

	Average Temperature (°C) ²	DMI (lb/day)	% TDN	% Crude Protein
1 st Trimester (Sept to Nov) - 3 months	-6	27	56	10
2 nd Trimester (Dec to Feb) - 6 months	-16	32	62	12
3 rd Trimester (Mar to May) - 9 months	10	28	63	13
Lactating - peak 2 months post-calving	19	31	65	13

¹ Used CowBytes v5.31 Alberta Agriculture, 2011 to estimate requirements under Manitoba conditions. Animal type was set to a British or smaller continental beef breed type; cows bred in August to calve in May; expected calf birth weight was 90 lb.; 20 lb. peak milk yield two months after calving

² Based on 92 year average temperature data from central Manitoba

What feeds will meet a beef cow's energy requirements?

In Table 2, there is a list of some feeds that are commonly used as energy sources when feeding lower quality hay or straw-based rations to increase the overall energy of the diet. In Table 3, there is a list of Manitoba forages and their resulting TDN and CP values. Using the feeds in these two tables, rations were formulated using CowBytes as seen in Table 4.

Table 2. Feeds that have a higher energy density (% TDN) and are commonly used for energy supplementation, on a dry matter (DM) basis or 100% dry¹

Feeds	% TDN	CP%
Barley	83.1	12.5
Oats	76.2	11.3
Corn	88.2	10.0
13% Range pellets	75.2	14.4
Canola screening pellets	68.6	15.7

¹ Adapted from feed tables in CowBytes v5.31 Alberta Agriculture, 2011

Table 3. Manitoba forage quality - average values, on an DM basis¹

Forage Type	% TDN	CP%
Grass-alfalfa hay (n=207)*	59.2	13.2
Alfalfa 2nd cut hay (n=383)*	62.9	21.6
Native hay (n=41)*	56.0	10.0
Barley greenfeed (n=227)*	62.2	11.4
Barley straw (n=241)*	45.2	5.5
Wheat straw (n=107)*	42.8	4.4
Oats straw (n=268)*	46.5	5.3

¹ Manitoba Average Feed Values for Beef/Bison/Sheep Producer (Samples sent to feed test lab from 2000 to 2005) *n values = the number of samples analyzed for TDN%

Table 4. Example rations for a 1350 lb mature beef cow under Manitoba conditions

Feedstuff 'as-fed' lb/head/day	1 st Trimester	2 nd Trimester	3 rd Trimester	Peak Lactation ⁵
Native Hay	25.5			27.0
Barley Greenfeed		28.0		
Grass-Alfalfa Hay			25.0	
Barley			5.0	8.0
Fortified trace mineral salt ²	0.071	0.071	0.071	0.071
Vitamin ADE ³	0.008	0.009	0.009	0.009
Vitamin E ⁴	0.015	0.015	0.015	0.015

¹ Used CowBytes v5.31 Alberta Agriculture, 2011 to formulate a balanced ration under Manitoba, using the assumptions as described at bottom of Table 1.

² Fortified trace mineral salt (brown salt) usually contains salt, cobalt, iodine, copper, zinc, and manganese.

³ Vitamin ADE premix containing 10 million IU's of Vitamin A per kg of product. (International Unit = IU),

⁴ Vitamin E premix containing 50,000 IU's of Vitamin E per kg of product.

⁵ If you had to feed harvested forages.

Matching dietary energy to what your cows require will keep your beef cows fueled up to optimize productivity and good health.

Livestock - Upcoming Stock Talk Webinars

Manitoba Agriculture is offering another series of livestock and forage presentations, packed with information, featuring innovative leading experts, aimed at helping Manitoba beef producers best manage their cattle operations. Find out the latest news on research and production for beef and forage management by participating in these virtual sessions.

Date: Dec. 8, 2022

Time: 1:00- 2:00 p.m.

Place: Your computer, smartphone™ or tablet

Register for StockTalk webinar

https://us06web.zoom.us/webinar/register/WN_U6k8yuJ-QLG9eFOXVAeHKg



Agenda

1:00 p.m. **Beef Cattle Nutrition - Cow and backgrounder rations** - Dr. John McKinnon

1:30 p.m. **Cow/calf and Backrounding Cost of Production** - MB Ag Farm Management

Future webinars

January 13 **Beef and Forage Week Highlights**

February 9 **Cattle Market 2022 Update**

March 9 **Ask the Vet - Bull Soundness and Bull Selection**

April 13 **Forage and Pasture Management**

For more information, call Manitoba Agriculture

1-844-769-6224 or email shawn.cabak@gov.mb.ca or lori.forbes@gov.mb.ca.

Submit your questions prior to, or during, the talk. Or visit our website at manitoba.ca/agriculture/online-resources/stock-talk.html.

Farm Business Management - New Calculators on webpage

As the economic risks of farming increase, the need to calculate a farm's cost of production rises exponentially. We have seen dramatic increases in costs - land values, interest rates, equipment, fertilizer, fuel, and many other operating costs.

The Farm Business Management team has completed the 2023 cost of production (COP) updates for cow-calf, backgrounders, replacement heifers, and finishers. The cow-calf budget now covers 300 and 150 cowherd sizes. There are eight preset balanced rations included in the winter feed, so producers can compare the economics of different feeding strategies. The cow-calf budget also has a full cost analysis on five different pasture options, including owned vs rented pasture. The principal and interest payments for fixed costs have been added. Now, there is the ability to calculate the total debt per cow and the debt servicing payment requirements. All of these budgets are designed to have producers put in their own values to generate a very producer-specific cost of production. The Beef Cattle Research Council's (BCRC) five per cent rule for profitability is included in the COP worksheet to help identify the impact of management changes on certain aspects of production.



Silage and hay budgets now have full analysis on AgriInsurance. The risk management section helps producers understand what AgriInsurance coverage they have in their own area and will calculate what payments could be with their own specific yields, in the event of reduced production. These budgets also have details on the economics of when to use custom harvesters versus harvesting the feed yourself, and identifying equipment cost per acre. All of the COP budgets are online at manitoba.ca/agriculture/farm-management/production-economics/cost-of-production.html

There are also several calculators available to help you make quick decisions about many other farm management issues on forage and livestock operations. FeedPlan looks at 20 different feedstuffs and calculates all feeds on a dry matter basis, as well as protein and energy. This calculator helps producers decide on the most economical feed purchases for their circumstances. This tool can calculate the cost differences of straw vs corn silage vs dry hay.

What is the most economical feed purchase? It will depend on what nutrients need to be supplemented and what feeds are readily available. This calculator makes that decision easy.

Is it economical to purchase lick tubs vs alfalfa hay as a supplement? Let this calculator do the math.

A number of these calculators are now available in an online version where the calculations can be done on mobile devices. These calculators can be found at this link. <https://calculators.masc.mb.ca/>

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Prairie Watersheds Climate Program

The Prairie Watersheds Climate Program (PWCP) is led by the Manitoba Association of Watersheds (MAW) and delivered by Manitoba's Watershed Districts and the Saskatchewan Association of Watersheds (SAW).

The PWCP provides up to \$40 million in financial support, through On-Farm Climate Action Fund (OFCAF), to producers in Manitoba and Saskatchewan to accelerate their adoption and implementation of on-farm beneficial management practices (BMPs) to reduce greenhouse gas (GHG) emissions, support production efficiency, sustainability and resiliency on their farm operations. To assist producers with their adoption of new BMPs, the program offers producers resources to support BMP implementation and provide BMP design recommendations.

The three BMP streams in the PWCP program are:

1. Improving nitrogen management:

- *for example, agronomic services to develop farm-specific nutrient management plans, equipment modifications for fertilizer application in fields, and soil sampling and analysis*

2. Increasing adoption of cover cropping:

- *for example, payment-per-acre to cover adoption or related costs, such as seeds and equipment for cover crops (e.g., plants, like clover and alfalfa) that are planted to cover the soil rather than for the purpose of being harvested*

3. Expanding the adoption of rotational grazing:

- *for example, agronomic services to develop grazing management plans, interior cross fencing, water system infrastructure, legume and forage seeds to support rotational grazing (e.g., the practice of containing and moving livestock through pasture to allow forage plants to recover, deepen their root systems and improve soil health)*

The Prairie Watersheds Climate Program is helping producers in Manitoba and Saskatchewan deploy real, measurable, and practical climate solutions for agriculture on the Canadian prairies by helping them create and implement rotational grazing plans. These include:

- Fencing to support the Rotational Grazing Plan - \$13,000/quarter to a maximum of \$50,000
- Watering systems to support the Rotational Grazing Plan - Up to \$2,000/quarter for stationary water system development and \$7,000/project for mobile water systems. Maximum allowed = \$50,000
- Improving pasture compositions by seeding legumes (e.g., such as alfalfa/sainfoin) - \$35/acre, up to a maximum of \$75,000
- Creation of Grazing Management Plan - 50% of cost of the plan, up to a maximum of \$400

Seed and Seeding Costs to Plant Regionally-Approved Cover Crops:

- \$35/acre to a maximum of \$75,000

Agronomic planning, with support of an agrologist, agronomist or Certified Crop Advisor, that includes the seeding of regionally-approved cover crops as a new or expanded practice of the farm operation.

Use of Nitrification and Urease Inhibitors - 85% of the cost of the inhibitors, up to a maximum of \$75,000

Agronomic Support for Nitrogen Management Plans

- 50% of total cost, up to a maximum of \$10,000 for soil testing
- 85% of total cost, up to a maximum of \$2,500 for soil mapping
- 50% of total cost, up to a maximum of \$10,000

Legumes to crop rotation

- \$35/acre for establishment, when approved under a one-year contract
- \$70/acre when approved under a two-year contract, with the payment split into a \$35/acre payment in year 1 and a \$35/acre payment in year 2, upon approval and annual verification
- Upgrading seeder equipment to allow for banding, side dressing and injection of fertilizer \$200 per foot of seeding equipment, up to a maximum of \$30,000
- Split Application of Fertilizer to improve Nitrogen use 85% of total cost, up to a maximum of \$75,000
- Upgrading manure injection and incorporation equipment - To be determined by PWCP Delivery Agent
- Offsetting higher cost of synthetic fertilizer substitutes (manure, compost, digestates) - To be determined by PWCP Delivery Agent

For more information, please go to manitobawatersheds.org/prairie-watershed-climate-program or speak with your local watershed representative.

Meet the New Provincial Livestock and Forage Extension Specialists!

Andrea Bertholet is the new Livestock and Forage Extension Specialist in southwestern Manitoba, working out of the Killarney office. Andrea has a degree in Animal Science from the University of Saskatchewan, and completed the Canadian Cattlemen's Young Leaders mentorship program in 2014. She has worked for Manitoba Agriculture since 2010, focusing on delivery of the Environmental Farm Plan and sustainable agriculture programs. Andrea grew up on a beef farm, and operates a 300 cow beef herd with her husband and family at Cartwright. Andrea is excited to get back to working directly with producers in the southwest focusing on livestock and forage production again.



Cindy Jack is joining the department as the Livestock and Forage Extension Specialist in the Interlake, working out of the Arborg office. Cindy recently graduated with distinction with an Animal Science degree from the University of Saskatchewan. She wrote an undergraduate thesis on the impact of nutrition on fetal growth and development in the final trimester in beef cattle. Cindy grew up on a beef farm near Portage la Prairie, and has continued to be actively involved in the farm operation. Cindy brings experience with research, crop scouting, and client relations from her previous work with Cargill, Syngenta Canada, and Nutrien Ag Solutions. She had a nine-month work term on a dairy farm in New Zealand, milking cows and caring for calves. Cindy was an active member of her local 4H club for over 10 years and held a number of executive positions.

Kristen Bouchard-Teasdale is returning to the department as Livestock and Forage Extension Specialist in eastern Manitoba, at the Beausejour office. Kristen was the department's livestock and forage specialist in St. Pierre for five years and has also served as a livestock nutritionist and Environmental Farm Plan program officer. Kristen has an Animal Science degree and Masters of Agriculture from the University of Manitoba. Working with Dr. Kim Ominski, Kristen researched the impact of tannins in the diet on the performance and methane production of steers and also worked on beef cattle pasture field trials at the university. Kristen has taught courses in the Diploma of Agriculture program and prepared course materials for soil health workshops at the university. Kristen grew up on a cow-calf farm near Fisher Branch and continues to help her parents with their farm operation. In her free time, Kristin enjoys travelling with her family, improving her Spanish speaking skills and growing a ridiculous amount of pumpkins and gourds.



Haylisting Service

Did you know that Manitoba Agriculture coordinates a free hay, straw and pasture listing service? Contact your local Manitoba Agriculture and MASC Service Centre to list or look for hay, straw or alternative feeds for sale on the hay listing. The service is free and can be found at:

<https://web31.gov.mb.ca/haylistcIntexrnl>



Fall Processing - Deanne Wilkinson, MB Ag Extension Veterinarian



Although autumn is a busy time of year, one detail that should not be overlooked in any schedule is fall processing of calves. Any producers not shipping their calves directly at weaning will see economic and welfare benefits to utilizing a proper fall processing program. The development of a sound plan involves consulting the herd veterinarian to assess management practices. Operations employing higher risk practices, such as purchasing cattle, will require more extensive vaccination protocols to prevent disease.

Key Components of Fall Processing

Processing is performed to provide calves with the best chance of success at a time when they are experiencing many stressors. It usually involves vaccinating, administering anti-parasitics, and ensuring calves are properly identified. Some producers will also add dehorning, castrating, and administering implants to this list. Vaccines may be the most influential element of processing and are usually aimed at preventing an initial viral infection, which can be followed by secondary bacterial infections.

Which Vaccines and Why?

Fall vaccinations provide protection against the most common viruses, bacterial pneumonias and clostridial infections. Adequate disease protection can be achieved through a myriad of vaccine combinations, which highlights the importance of working with a veterinarian to develop the most suitable plan. Usually, producers use a two or three-injection protocol, although calves not vaccinated at spring turnout will require boosters to be given, according to label, after fall processing.

A modified-live virus (MLV) vaccine containing the five common viral pathogens, Infectious Bovine Rhinotracheitis (IBR), Parainfluenza-3 (PI3), Bovine Respiratory Syncytial Virus (BRSV), and Bovine Viral Diarrhea (BVD) Type I and II, is commonly given during processing. MLV vaccines typically provide stronger immunity than killed vaccines, but calves receiving this type of vaccine have the potential to shed the MLV. If calves return to their dams after processing, the cows must have received the same MLV vaccine within the previous 12 months to protect against the slight chance of abortion. In an effort to provide broad pneumonia protection, most producers will opt for a MLV vaccine also containing bacterial pneumonia protection for *Mannheimia haemolytica*, with or without *Pasteurella multocida* coverage.

The other vaccine of importance is a killed clostridial vaccine, as immunity to clostridial diseases, such as blackleg, is waning by the time of weaning. This vaccine can also contain constituents that provide protection from *Clostridium tetani* (tetanus) or *Haemophilus somnus*, a bacterial pathogen that can damage the lungs and other organs. It is important to remember that calves requiring castration should receive at least one dose of a vaccine containing tetanus protection, at least two weeks before castration.

Although fall processing does not guarantee perfect health, it minimizes the damages during more challenging years.

If you would like to be added to our information-sharing list, please email or text Juanita Kopp
Juanita.Kopp@gov.mb.ca, 204-825-4302. Your input or topic ideas are always welcome.

Contact us

- [Go to manitoba.ca/agriculture](http://manitoba.ca/agriculture)
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