



Department of
Agriculture

Feeding Cull Potatoes to Beef Cattle

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Prince Edward Island potato producers have been planting approximately 100,000 acres of potatoes per year. The cullage rate from these potatoes can vary from 5 -10 percent of the crop. As a result there can be up to 100,000 tonnes of cull potatoes available for feeding each year.

What's in Cull Potatoes?

Potatoes are a high energy feed which makes them suitable for finishing rations in beef feedlots. The energy content of potatoes is similar to barley. Potatoes are low in protein, calcium and magnesium but high in starch. Potatoes have a very high water content, they are 80 percent water or 20 percent dry matter. This means that if you put 50 pounds of cull potatoes in front of a steer you are offering him 40 pounds of water and 10 pounds of dry feed but they are very palatable and cattle will often exceed their potential dry matter intake by about 1 lb when potatoes are in the diet. On an as-fed basis it takes about 4.5 pounds of potatoes to replace one pound of barley. If you replace more than half of the barley with potatoes, check with a nutritionist to determine if a protein supplement is required.

The ideal feedlot ration is a total mixed ration of forage, grain, potato, minerals and vitamins thoroughly mixed so that every bite an animal takes is the same. Potatoes can be treated as a wet grain. Determine the amount of dry matter that your pen of cattle can consume.

Table 1. Dry matter intake potential per day

	Large Frame Steers gaining 3.0 lbs/day	Medium Frame Steers gaining 2.5 lbs/day
Weight of Animal	lbs dry matter intake	lbs dry matter intake
500 lbs	13.0	12.0
700 lbs	17.5	15.2
900 lbs	21.5	18.5
1100 lbs	25.3	21.5
1300 lbs	28.5	24.3
1500 lbs	30.5	--

Formulate your ration from the feeds available by determining out how much dry matter from each feed you want to deliver to each animal per day. Here is an example of a typical ration for a 1100 lb large frame steer. Recent research trials at the Nappan Experimental Farm showed that the best gains (3.75 lb/d) were observed when cattle were fed equal portions of potato by-products and barley on a DM basis.

Table 2. Example rations: 1100 lb large frame steer consuming 25.3 lbs of dry matter per day

	Ideal Ration	Dry Matter Intake	As-Fed Intake	Diet Limits
Forage (40% DM)	20%	5.1 lb	12.8 lb	10%
Cull Potatoes	40%	10.1 lb	50.5 lb	57%
Grain	40%	10.1 lb	11.5 lb	33% (ATBC spec)
Minerals/Vitamins	-	-	-	-
Rumensin	-	-	-	-

Feeding Tips

Cattle can and will consume large quantities of potato products if given the opportunity. They can consume up to 10 percent of their body weight in potatoes. Feeding high levels of potato by-products can

cause the rumen to become acidic particularly in situations where dry matter intake is not monitored or controlled. Cattle with acidotic rumens will tend to go "off feed" which reduces daily gains. Cattle that are constantly going on and off feed because dry matter intake is not controlled develop feed sickness which can result in sudden death of the animal late in the feeding period.



When increasing the feed supply to the animals never increase the amount of feed offered by more than 0.5 lbs of dry matter per head per day. If the feed intake increases too rapidly cattle will go off feed resulting in lower performance.

In Idaho, it has been demonstrated that cattle fed high levels of potato diets will respond to the addition of limestone to the diet. The limestone acts as a buffer and reduces the level of acidity in the rumen and small intestines. Alternatively sodium bicarbonate can be used as a buffer. The recommended level of buffer inclusion is 0.5 percent to 0.75 percent of the daily dry matter intake.

Potatoes are low in magnesium. Be sure to check that your mineral package includes a source of magnesium. Feeding an ionophore such as Rumensin is useful in two ways. The ionophore has the affect of improving feed efficiency and reducing acidosis while helping to reduce problems associated with clostridial buildup from the soil which naturally is present in some sources of cull potatoes.

Cattle fed whole cull potatoes are prone to choking on the potatoes. The cattle will normally bloat and die if the potato is not removed.

Reduce the potential for choking by observing the following steps:

1. Keep the cattle on full feed. Hungry steers have a tendency to fight at the feed bunk which increases the chance of choking.
2. Ideally, crush or chop the potatoes prior to feeding - see section below
3. Ensure that feed bunk cable or neck railing forces the animal to keep its' head down while eating potatoes.
4. Frozen potatoes are usually not a problem for cattle who are accustomed to eating potatoes. Be careful not to feed cattle that have been consuming frozen potatoes a batch of fresh unfrozen potatoes. The cattle can quickly over consume the potatoes causing bloat.
5. Get a source of clean culls from a wash plant. Culls can sometimes contain large portions of stones or soil which reduces its feeding value. Potatoes from wash plants are usually free of soil and stones. Stones are a nuisance since they usually have to be cleaned from the bunk prior to the next feeding.
6. Cattle which are fed diets high in potatoes require more bedding than normal to keep them dry.

Feedlot Performance

Cattle fed cull potatoes should have similar performance in the feedlot to grain fed cattle assuming good feed bunk management is practiced. Experiments conducted by the Prince Edward Island Department of Agriculture & Forestry and the Atlantic Veterinary College demonstrated that beef steers would gain 3.3 pounds per day on a diet of potatoes, barley, supplement and hay. The test was conducted using cull potatoes on 700 lb cattle. These cattle were sent for slaughter at 1100 pounds.

Each steer consumed an average of:

Hay	1037 lbs
Potatoes	6552 lbs
Barley	601 lbs
Supplement	164 lbs
Minerals	28 lbs

On Farm Storage

Culls are normally delivered to the farm in 10 - 30 tonne loads. They can be piled outside if they are to be fed within a few days. They will keep longer if stored in a covered storage area away from direct sunlight. During cold weather they will freeze which makes them easy to store as long as they remain frozen. To prevent freezing they can be covered in a barn with tarps or straw. During warm weather they will break down relatively quickly which reduces their feed value. "Sunburned" or green potatoes and sprouted potatoes can contain toxic alkaloids and can only be fed in small to moderate quantities. Storing potatoes to be fed after June 15 requires a "Feeding Permit" from the Department of Agriculture. The permit will be issued to farmers who agree to manage the storage of potatoes in a manner which prevents the spread of diseases to the crop growing in the field.

Ensiling Cull Potatoes - see separate factsheet

Whole potatoes can be ensiled by layering them in a horizontal silo with wilted hay crop silage. However, large quantities of cull potatoes are not always available when silage is being made. Potatoes can be ensiled in a 2:1 ratio with hay crop silage assuming that drier silage is being used. If low dry matter silage is used there may be excessive seepage from the pile. Clean cull potatoes should be used, as excessive quantities of soil will interfere with the fermentation process. Chopping the potatoes should result in a better fermentation.



Potato Choppers

There are a number of different methods for chopping or crushing cull potatoes. Large "slinger" type manure spreaders will do a good job of busting up cull potatoes (see picture).

A number of portable and stationary potato crushers have been produced locally. The first one on the market was a "flail" type. It consists of a potato hopper mounted over a set of flails. The flails chop the potatoes into small pieces. They work best with stone free potatoes, because stones will break or jam the flails. The "crusher" types, usually has a potato box with a chain conveyor on the bottom which delivers the potatoes to a set of rollers which crush the potatoes. These work the best if there are no rocks but smaller sand stones can usually be handled without too much problem. The rollers can be electrically or hydraulically driven.

