Ontario

OMAF *Virtual Beef*

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In This Issue

Making Sense of the National Strategy Plan for the Beef Industry

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On September 10, 2004 the federal government announced the **new BSE Repositioning Strategy**.

So…

- Why the need for a national strategy… delayed marketing, backlog of cattle, limited slaughter capacity?
- What are the details about both set-aside programs - Fed cattle and Feeder cattle?
- What points do I need to ponder, before participating in either program?

Why The Need For A National Strategy?

Increased abattoir capacity is expected to rebalance the supply of and demand for live cattle by 2006. **Set-aside programs** have been developed to **delay marketing** until this capacity comes on line, and match available slaughter cattle with available kill capacity. Table 1 projects the surplus cattle at year-end and Table 2 summarizes current and projected weekly kills.

……………………….*continued next page*

Virtual Beef is a technology transfer vehicle of the Ontario Ministry of Agriculture and Food.

This publication is available in electronic format at http://www.gov.on.ca/OMAF/english/newsletters.html

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Table 1.
Approximate Canadian
Surplus Cattle by Year-End 2004

2004 **Q4 (year end)**	Based on Average 2004 Weekly Kills of 74,000
	Number of Head
Fed Cattle	150,000
Non-Fed Cattle	300,000*
TOTAL	450,000

*many cull cows were bred and are back in the herd. – not a "wall" of cows waiting to be killed.

Table 2.
Canadian Cattle Slaughter Capacity

	Weekly Kill (Fall 04)	Weekly Kill* (Fall 05)
Federal Plants Fed Cattle & Non-Fed Cattle	77,400	91,400
Provincial Kill Fed Cattle & Non-Fed Cattle	3,600	3,600
TOTAL	**81,000**	**95,000**

*projected

By 2006 there is potential for a 100,000 + weekly kill. This is a full capacity kill, which is based on a 6 day kill in the larger plants. Traditionally we have run at 85 % of plant capacity. Based on a 5.34 million beef cowherd in Canada, the goal is to balance the supply and demand of fed cattle with the slaughter facilities. Hopefully this balance can be achieved by early 2006.

Highlights Of Set-Aside Programs

Fed Cattle

General

- Eligible participants - anyone who finishes cattle
- Producers must register with OMAF **(1-888-292-5856)** to receive **bidder registration number** and your **Personal Identification Number (PIN #)**
- You need to register prior to the auction opening.
- Auction currently run weekly from 2:00 p.m. Monday - 2:00 p.m. Wednesday
- Producers fax bids to **1-866-790-4844**
- Bids are $/head/day, a min group of 20.
- Bids are accepted from lowest bid until the **target number of cattle** are reached OR **a ceiling bid price** is reached

If Successful In Your Bid

- You will be notified and sent an application form.
- Fill in the CCIA numbers for the set-aside cattle.
- Sign the agreement form.
- You will be visited by an **On-Farm Verification Agent.**
- Cattle will be held for **set-aside** period between **90-120 days.**
- No up front payments - settlement is made at the end of the feeding period

Eligible Cattle for Fed Set-Aside

- Groups of 20 head
- Average Wt. of lot:1300 lbs. for steers, 1200 lbs. for heifers
- Individual steers must weigh at least 1100 lbs., and heifers at least 1000 lbs.
- Expected to grade A.

Feeder Cattle (Calf Component)

General

- Application forms available phone **1-888-292-5856** or at **OMAF Resource Centres**, or OMAF **Web Site**
- Eligible participants - cow/calf operators and backgrounders
- Goal is to set aside 115,000 calves in Ontario
- Deadline is **Jan 15/05** or when **fully subscribed**
- **Your Commitment**
- Calves must **not** be **slaughtered** until **2006**

- Must **set aside 40% of calves** - based on date of application
- Calves must be tagged with **Set-Aside RFID tags available through BIO**
- Must **hold** set aside cattle **until** at least **September 2005**
- can be resold then, but still can't be slaughtered until 2006
- when sold, a signed purchaser's agreement must be submitted.

Payment

- **$190/eligible animal** plus **$10 for tagging costs**.
- Payment up front

Points to Ponder

General

- These programs are designed to cover added costs incurred by delayed marketing. If you need to make major changes to your operation to accommodate either program, then carefully consider the cost of these changes.

Financial Considerations

- possible cash flow shortfall
- reduced capital turnover

Production Considerations

- feed and/or pasture needs and costs
- added health costs
- additional housing and labour requirements

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Vaccination Survey Information

The Ontario Ministry of Agriculture and Food Beef Staff requests your help in determining **levels of vaccination** for respiratory diseases in beef cattle in Ontario. By linking to the following web address, you will have the opportunity to complete a five-minute survey on your farm's vaccination strategies.

http://www.surveymonkey.com/s.asp?u=3420661121

Thanks for your assistance and input!

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Cold Stress In Cows

Brian Tarr, Ruminant Nutritionist, Shur Gain

Brian is an acknowledged expert in ruminant nutrition, with a particular expertise in applying scientific theory to real life situations. He has conducted research and served as a Provincial Feed Advisor for OMAF, as well as playing key roles in industry. ….. VB

What Is Cold To A Cow?

When temperatures start to decline in winter, particularly as we get closer to 0° Celsius (or 32° F), producers need to think about what effect this is having on cow productivity and efficiency. Like all mammals, cows are "warm blooded" and need to maintain a constant core body temperature. Normal rectal temperature for a cow is around 38° C (101° F).

Within a range of environmental temperatures, called the **thermoneutral zone**, animals do not have to expend any extra energy to maintain their body temperature. Down to the lower end of this range, normal metabolic processes supply enough heat to maintain body core temperature. Within their thermoneutral zone, animals may modify their behaviour, such as seeking shelter from wind, and respond over the long term by growing a thick hair coat for winter, but nutrient requirements are not affected. However, below the lower limit of the thermoneutral zone, called the **lower critical temperature**, the animal experiences cold stress. In order to combat cold stress the animal must **increase its metabolic rate** to supply more body heat. This increases dietary requirements, particularly for energy. Typical lower critical temperatures for beef cattle are affected by a number of factors. **Table 1** shows the impact which different hair coat types can have on lower critical temperature.

Table 1. Lower Critical Temperatures For Beef Cattle, Assuming No Wind Chill

Coat Description	Lower Critical Temperature °F	Lower Critical Temperature °C
Summer coat or wet coat	59	15
Fall coat	45	7
Winter coat	32	0
Heavy winter coat	18	-8

Cattle, like humans, actually experience the **"effective temperature"** which takes into account both air temperature and the effect of **wind chill**. Cool or cold wind passing over an animal draws heat away from it much more quickly than still air at the same temperature. Wind chill effects for cattle are shown in Table 2. This chart assumes a dry, clean hair coat. If the animal is wet and/or dirty, this chart will underestimate the effect of the wind.

Table 2. Wind Chill Effects For Cattle With Winter Coats (values within table are effective environmental temperatures) ƒ*									
Wind Speed (kph)	Air Temperature (degrees Celsius)								
	-18	-15	-12	-9	-7	-4	-1	+2	+4
0	-18	-15	-12	-9	-7	-4	-1	+2	+4
8	-21	-18	-16	-13	-11	-8	-5	-2	+1
16	-24	-21	-18	-16	-13	-11	-8	-5	-2
24	-26	-23	-21	-18	-16	-13	-10	-7	-4
32	-29	-26	-23	-21	-18	-16	-13	-10	-7

ƒ **assumes that hair coat is dry and clean**

*example: when air temperature is –18° C and wind speed is 24 kilometers per hour, the effective temperature experienced by the animal is the equivalent of a still air temperature of –26° C

If cows are exposed to wind or drafts, it is important to adjust for the "effective temperature" and take the appropriate steps to ensure that the cows can maintain body temperature and weight.

Factors Affecting An Animal's Ability To Withstand The Cold

- **Acclimation:** Cattle do adjust or acclimate to colder weather by growing a longer, thicker coat. This provides additional insulation against cold weather. The coat must be clean and dry to provide maximum protection to the cow. Dirt or moisture on the coat reduces its insulation value dramatically.
- **Fat Layer:** Cattle in good condition with a thick fat layer are better able to withstand the cold than thin cattle. The fat layer acts as another insulating layer between the animal's core and the environment.
- **Metabolic Rate:** Cows will also increase their metabolic rate to increase heat production and help maintain body temperature. This increases the need for dietary energy, so appetite is usually increased and cows eat more.

The Effects Of Severe Cold Stress On Cattle

Hypothermia occurs when body temperature drops well below normal. In general terms, with cattle, mild hypothermia occurs with a body temperature of 30 – 32° C, (86 - 89° F), moderate hypothermia at 22 - 29° C, (71 - 85° F) and severe hypothermia below 20° C (68° F). As rectal temperature drops below 28°C (82°F), cows are not able to return to normal temperature without assistance through warming and administration of warm fluids. As hypothermia progresses, metabolic and physiological processes slow down, and blood is diverted from the extremities to protect the vital organs. Teats, ears and testes are prone to frostbite. In extremes, respiration and heart rate drops, animals lose consciousness and die.

In most situations a more insidious and costly problem occurs. Cows are subjected to an environmental temperature below the lower critical temperature, but without obvious signs of hypothermia. This increases the maintenance energy requirement of these animals as they adjust to the conditions and **divert more energy to maintaining body temperature**. There are two potential responses to this situation:

1. **Cows have access to higher quality feed and/or increase intake, and therefore maintain body weight.**

Cows try to increase feed intake in an effort to meet their energy requirements. Given the opportunity and gut capacity, **cows will eat more feed** to help meet their increased energy demands. Practically, it is usually expedient to feed grain as well. This increases feed costs, increasing the cost of keeping cows, however the expectation is that cows will maintain their body weight!

It is generally accepted that for every **1°C drop below the lower critical temperature, there is approximately a 2 percent increase in energy requirements**. The amounts of additional feed required for a cow under cold stress can be calculated, but as a rule of thumb, a cow with a dry winter coat should be fed the additional feed as presented in Table 3.

Table 3. Effective Temperature And The Additional Feed Required Meet The Cow's Energy Requirements

Effective Temperature (°C)	Extra Energy Required (%)	Extra Hay Required (kgs/cow/day)	Extra Grain Required (kgs/cow/day
-1	0 %	0	0
-12	20 %	1.6 – 1.8	0.9 – 1.0
-23	40 %	3.2 – 3.6	1.8 – 2.3

Cows may not be able to eat the amount of extra hay required to maintain their body weight and will have to be fed additional grain to meet their energy requirements.

2. Cows don't have increased feed quality and intake and lose body weight.

If cows are not fed additional feed or the quality does not allow them to eat enough to meet their additional energy requirements, body mass will be "burned" to produce metabolic heat. These **cows lose weight** as both feed energy and stored fat are **diverted to maintain body temperature** and vital functions. Cows in this situation that start to lose weight soon enter a downward spiral - the more weight (fat) they lose the less insulation they have, the more susceptible they are to further cold stress, and they lose weight even faster.

Cows and especially heifers that lose weight **calve in poor condition.** The **consequences** are increased calving difficulties, an increase in the number of lighter, weak calves and higher calf mortality. These dams produce a reduced amount of colostrum (of lower quality) and have lower milk production, increased neonatal mortality and reduced growth rate in surviving calves. These cows usually have delayed return to estrus, longer days open and poorer reproductive success.

Key management factors to limit the effects of cold stress

- **Monitor the weather.** Monitor temperature and increase feeding in response to cold weather. Cows in the last trimester require additional grain feeding during periods when the effective temperature falls below the lower critical level.
- **Protect animals from the wind**. Wind markedly reduces the effective temperature, increasing cold stress on animals.
- **Bed cows well.** Providing adequate dry bedding makes a significant difference in the ability of cattle to withstand cold stress.
- **Keep cows clean and dry**. Wet coats have greatly reduced insulating properties and make cows more susceptible to cold stress. Mud caked coats also reduce the insulating properties of the hair.
- **Provide additional feed.** Feed more hay and grain. If wet feeds are fed, make sure they are not frozen.
- **Provide water.** Make sure cows have ample water available at all times. Limiting water will limit feed intake and make it more difficult for cows to meet their energy requirements. Frozen troughs and excessively cold water seriously limit water intake.

We can't control the weather but we can do everything reasonably possible to reduce the effects of cold on cows. This will help reduce costs and improve production efficiency.

----------------------- VB --------------------------

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Cull Cows – Establishing Carcass Composition

Don Blakely, Beef Quality Program Lead

With limited slaughter capacity for cull cows in Eastern Canada and an American border closed to live animals and meat products from animals over 30 months of age, producers are investigating marketing alternatives to increase returns from cull cows. Live auction prices are only 10-20% of pre-BSE prices. Beef and dairy producers are asking if there are ways to add value to their cull cows through direct marketing to consumers, or feeding to improve carcass value.

The article deals with the terminology used to describe cull cows, cow carcass composition, and quality and the edible and non-edible products from cull cows.

Terminology

Canadian Carcass Grading System for Cows

Our grading system categorizes mature cow carcasses into the grades D1, D2, D3 & D 4 based on the following criteria:

D1 – excellent muscling, with less than 15 mm of firm, white or amber coloured backfat

D2 – medium to excellent muscling, with less than 15 mm of white to yellow backfat

D3 – deficient muscling with less than 15 mm of backfat

D4– deficient to excellent muscling with greater than 15 mm of backfat

In contrast to the grading of fed cattle, the mature cow grading system does not include marbling as a criteria. In addition, the grading system is not used very extensively for establishing payment for cull cow carcasses, contrary to the situation with fed cattle. Although live auction markets will describe "D1, D2 cow prices", this is an estimate of what their carcasses will grade after slaughter. The D1 and D2 categories are those which have the highest carcass value.

Body Condition Score

Body condition scoring (BCS) is a rating of fatness based on visual evaluation. In Canada, a scale of 1 to 5 is used, with 1 being extremely lean and 5 being extremely fat. In the United States scoring is on a scale of 1 to 9, where 1 is very lean and 9 is very fat. The BCS does not describe muscling. While BCS is not often used in describing the potential grade of cull cow carcasses, it may be predicted that a BCS 1 cow would grade D3 and a BCS 5 cow would grade D4.

Cow Carcass Composition

Cow carcass composition varies considerably in terms of carcass weight and percentages of fat, lean and bone. The percentage values in the following outline are ranges where the majority of animals will fall, but there will be some individual cows, which will be outside these ranges.

Starting at the point of slaughter, live weight (LW) is reduced to hot carcass weight (HCW) by removing the hide, head, feet, tail, entrails and associated gut fill. The term dressing% describes the proportion of HCW relative to LW, where Dressing% = [(HCW/LW) X 100)]. Dressing% of cows usually ranges from 48-55%. Factors, which will affect dressing%, include the amount of gut fill and stage of pregnancy. Animals with a high level of gut fill and/or which are in advanced pregnancy will have a lower dressing %. Levels of both fatness and muscling also impact on dressing %. An animal which is quite fat and/or heavily muscled will have a higher than average dressing%. Conversely, a cow which is thin and/or lightly muscled will have a lower than average dressing%.

Live Weight (LW)

↓

Hot Carcass Weight (HCW)
48-55% of LW

↓

Cold Carcass Weight (CCW)
Approx.. 99% of HCW

CCW - Percentage content of bone, fat and lean
Bone 17-32%

Fat 7-30%

Lean 49-63%

Saleable Product
70% of CCW or approx. 36% of LW

Cold carcass weight (CCW) is the weight of the carcass after chilling. The hot carcass loses about 1% of its weight, during cooling, which is due to loss of moisture. On average, CCW is 99% of the HCW. Very lean carcasses will have greater moisture losses than fat carcasses. The composition of the cold carcass consists of varying percentages of bone, fat and lean tissue. The primary factors affecting these percentages are the degree of muscling and the level of fatness. The **amount** of bone in animals of a given frame size is fairly constant, but the amounts of both fat and muscling show large variations among different animals of the same frame size.

Due to the variation in fat and lean content, the **proportion** of bone can range from 17-32% of the CCW. Fat and/or well-muscled cows have more non-bone material in the carcass, so the percentage bone makes up is decreased. Very lean and/or poorly muscled cows will have a correspondingly high % of bone. Fat% can range from 7-30% of the CCW. The greater the backfat of the cow the greater the percentage fat.

Lean content of the CCW can vary from 49-63% but it is not a linear relationship as exists with fat and bone. Percent lean is lowest with fat cows and highest for cows we would describe as in ideal body condition score and heavily muscled. Very lean, heavily muscled cows would fall in the 58-60% range.

Carcass Content and Edible and Non-Edible Products from Cull Cows

Products and estimated weights are shown in the following schematic example:

1500 pound cull cow, open, BCS 3, expected to grade D1

Removed from carcass

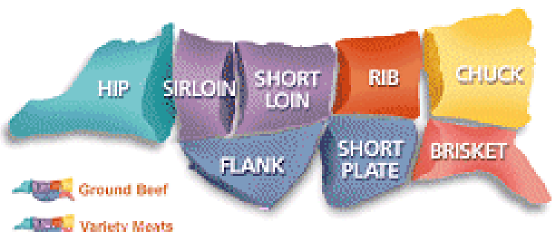
Non-edible
- hide, head, feet, entrails, manure

Edible
- heart, lungs, liver, tongue, cheeks, tail

53% HCW = 795 lbs.
99.5% CCW = 791 lbs.

Non-edible
Bone 28% = 221 lbs.

Edible
Fat 15% = 119 lbs.
Lean 57% = 451 lbs.



5% of CCW marketed as cuts from rib, short loin & sirloin

15% of CCW marketed from hip for further processing

52% of CCW to grinding

5% cuts from rib & loins x 791 CCW = 39.5 lbs.

15% hip x 791 CCW = 118.5 lbs.

52% for grinding x 791 CCW = 411 lbs.

Considering the above information one should be able to evaluate a cull cow to predict the weight of salable lean meat. Start with live weight, make estimates of gut fill, fat thickness and muscling, then apply your predictions to the percentage ranges listed above. You should be within a couple percentage points of actual lean and fat content.

------------ VB -----------

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Meeting Water Needs For Winter Grazing

Jack Kyle, OMAF Grazier Specialist

Late fall and winter grazing can reduce your feed costs. Stockpiled forage makes good late season pasture. An acre of corn stalks will feed a beef cow for one to two months. However, **fencing and water** are often the two major obstacles to realizing these opportunities. A temporary electric fence can effectively contain livestock, solving problem one. However, with cold weather and freezing temperatures, adjustments must be made to the watering systems. Fortunately, nature provides animals with some helpful adjustments which reduce water intake. One of these is the fact that water requirements are reduced with cold temperatures. Another is that animals will also eat snow to meet some, if not all, of their water needs.

Drinking Snow

Pregnant non-lactating females, such as dry beef cows, can most readily adapt to this type of winter pasture scenario. They have much lower water requirements than lactating females. If these animals have access to **clean fluffy snow** they will not require any additional water. Studies conducted at the University of Alberta in the early 1990's showed that non-lactating pregnant beef females received adequate water from the snow alone, and were as productive as those animals that had access to water in a trough or water bowl.

When livestock are eating stockpiled forage, it is usually fairly high in moisture content and covered with snow. In the process of eating forage they are going to ingest a significant amount of snow. When these moisture sources are considered, along with their reduced requirement during the cold weather, the amount of liquid water required is not as high as one would expect. For optimum intake, the snow should be soft and fluffy so that the livestock can easily eat it. Hard, icy snow will scratch the animal's muzzle and discourage intake.

Water Sources

It may be practical for livestock to walk a greater distance to water than would be acceptable in warm weather because their water requirements are lower. In cold weather, dry cows will likely only drink once or twice per day. There won't be as much time spent walking to water as in the summer when consumption is much higher. The herdsman can make effective use of a single water source by rationing the stockpiled forage by starting the grazing close to the water source and then advancing the fence.

A solar or wind powered air bubbler system can be used to prevent a water trough or surface water source from freezing over. Using a water wagon to haul water is another possibility. As livestock water requirements are lower in winter, this option will be more practical than in the summer months.

Winter grazing will reduce the requirement for stored feed and **reduce feed costs**. By investing a few dollars in temporary electric fence and using snow as a water source, you will be able to utilize forage that would otherwise be lost to your operation.

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Use Caution When Agitating Raceway Manure Systems!

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Circulatory or "raceway" manure agitation systems have become common in slatted floor livestock barns since they were first introduced in the mid 1980's. Several **structural failures** of components in these systems **during manure agitation** in the last few years are a cause for concern. It is important to design and construct these systems properly and it is particularly important to use caution when agitating.

Description of System

The circulatory or "raceway" manure agitation system is commonly used in slatted floor hog, dairy, and beef barns. The system consists of two or more inter-connected channels that lead back to one circulation or agitation point (Figure 1). There are two basic applications of this system. One design used has a single manure storage with a dividing wall down through the middle, like a heifer barn with a slatted manure storage next to the feed manger. The second is used where the manure storage is under the whole barn or at least a major portion of it. Channels are typically 6' - 13' wide and 8' - 12' deep, although they can be wider and deeper. Since the channel walls act as a support for the slats, the channel width depends on the slat width.

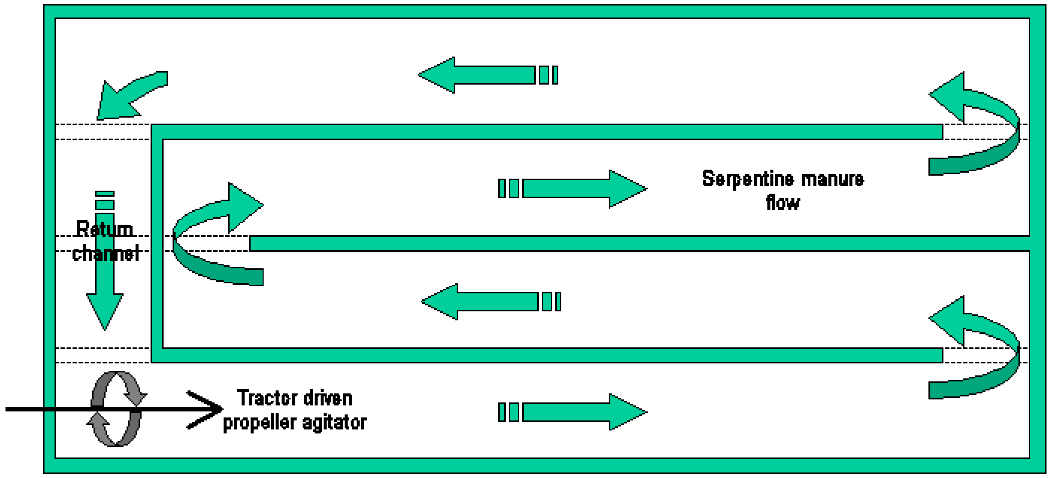

Figure 1. Schematic of raceway manure agitation system

Why they are Popular

These systems are popular for several reasons. The single manure gutter or entire barn can be agitated from a single point. It takes less time and horsepower to agitate than a similar size manure storage that is one single tank. Another reason the system is popular is because the channel walls can be used to support the slats instead of a series of posts and beams.

How they work

Raceway manure systems are agitated with a propeller type agitator. The agitator is inserted into an agitation port usually located outside of the barn. The agitator forces manure around the raceway until it completes the circuit and returns to the agitator. The flow of manure around the raceway is used to break up any crust formed on the manure and to dislodge any solids that have settled to the bottom of the storage.

Care must be taken when agitating this type of system. If the manure does not start to circulate or flow right away two things can happen. A backup of the manure can cause the manure level to rise (Figure 2). If the pressure continues to build before the manure starts to move around the raceway, the **manure can rise** to the point that it **lifts the slats**. The slats commonly provide lateral support for the dividing wall. If the slats lift because of the manure pressure from below, the support for the wall will be removed, and the wall can move. This can lead to either the **partial or complete collapse** of the wall, causing the slats and any livestock above to fall into the storage below (Figure 3). It is also possible that if sufficient pressure builds up before the manure starts to move, this can lead to the collapse of the dividing wall as well.

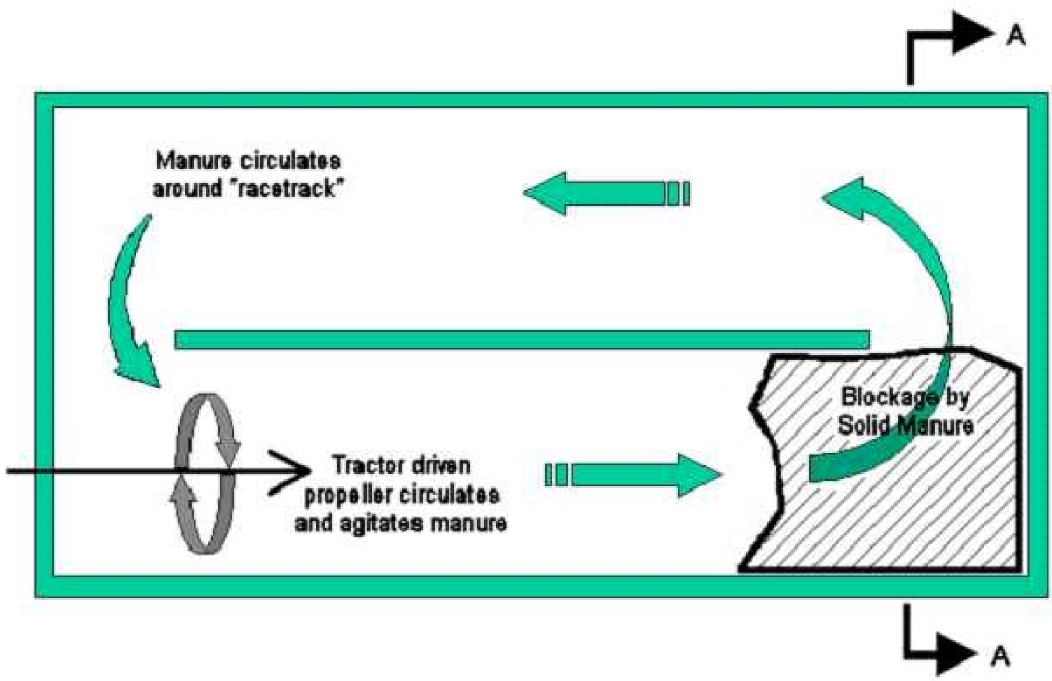

Figure 2. Potential problems exist when agitating manure

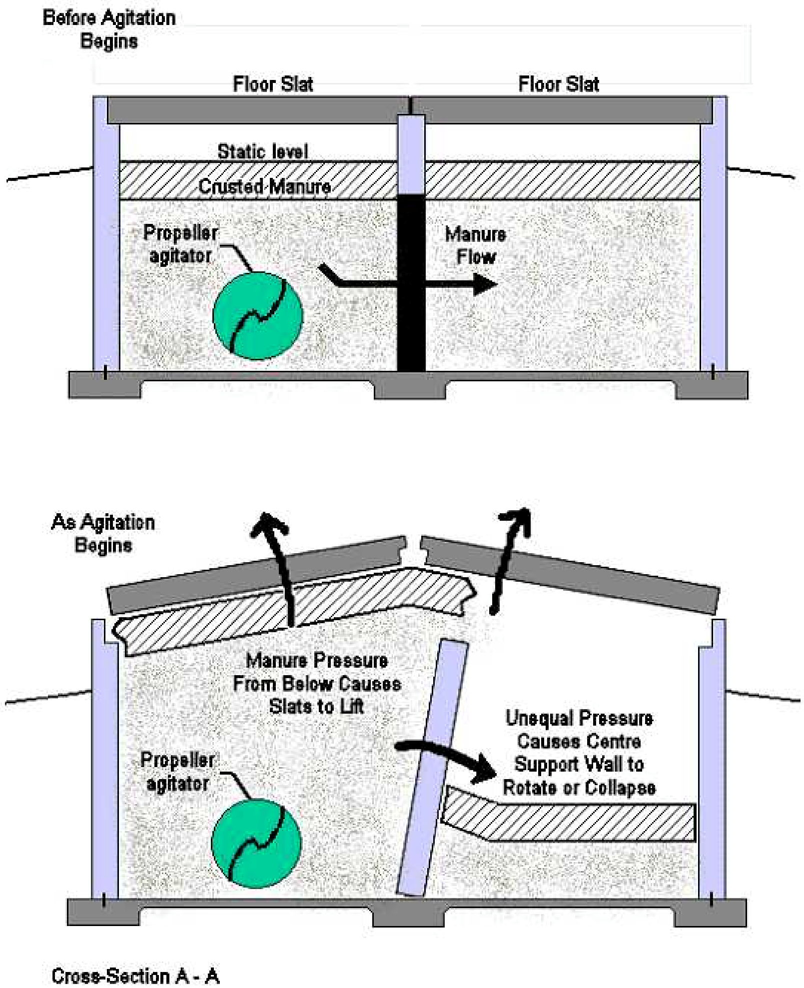

Figure 3. Pressure as agitation starts can cause slats to lift and wall to move

Agitation

It is recommended that the manure storage be **agitated completely** when the **storage** is about **half full**. This breaks up any crust that has formed on top of the manure and homogenizes the manure. When the storage structure is **full** it should **be agitated completely again**. If the storage was **not agitated during filling**, you should **not try to agitate when it is full**. It is best to **slightly stir** the raceway with the agitator and remove enough manure to lower the storage to the point where it can be safely agitated.

The agitation speed must be adjusted to the level of manure in the pit. Start the agitator slow enough to just move the manure without building up too much pressure. As the manure starts to circulate around the racetrack, the agitation speed can be increased.

Never aggressively agitate manure when it is in contact with the slats or support beams. Agitating manure can release poisonous gases in the manure. Turbulence caused by contact with the slats and beams can increase the release of gases. Make sure that **all people**

and livestock are as far away from the agitation port as possible.

Construction concerns

Manure stored in raceway systems puts **pressure on support and dividing walls**. These walls must be **designed to withstand normal pressures** caused by the manure and the **extra pressure** exerted during agitation.

Care must be taken during design and construction to make sure that lateral support is in place for all walls. Support can be obtained by creating a rigid connection between the floor and the wall, or support can be obtained with notched slats resting on top of the wall. If the design of the wall relies on the slats for support, they should be pinned to the top of the wall to ensure that they cannot lift during agitation. If you have concerns with your current system, you should have it checked by a qualified contractor, or professional engineer.

Summary

Circulatory or raceway agitation systems can be used to effectively homogenize manure before it is removed from storage. Recent wall failures should remind producers to take care during agitation. Raceway systems should be agitated completely when the manure storage is about half full, and again before emptying the storage. It is important that the **design and construction** of raceway systems allow for the **pressures generated during agitation.** Proper design construction and management of these systems will lead to many years of trouble free use.

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