OMAFRA Virtual Beef

VOLUME NO. 11 ISSUE NO. 35 October 2012

Should They Stay or Should They Go?
Marketing Weaned Calves vs. Backgrounders

Tom Hamilton, Beef Program Lead-Production Systems
Ontario Ministry of Agriculture, Food and Rural Affairs

Introduction

Cow-calf producers need to consider marketing options for their calves. Along with the choices of direct to buyer vs. auction mart, or regular sales vs. special sales, they have the option of retaining calves after fall weaning. These calves can be backgrounded over winter on a forage based ration and sold come spring, hopefully into the traditionally "hot" market for grass cattle. But will backgrounding calves put more dollars into the producer's pocket? This article compares the financial outcome of selling calves at weaning with marketing them as stockers in the spring. The resulting Net Margin (the difference between selling as stockers vs calves) is projected over a wide range of both calf and stocker prices.

Figure 1. Choosing to background depends on a number of factors.

IN THIS ISSUE

OMAFRA Virtual Beef is a technology transfer vehicle of the Ontario Ministry of Agriculture, Food and Rural Affairs.

This publication is available in electronic format at www.omafra.gov.on. ca/ english/livestock/ beef/ news.html

Single paper copies may be obtained by calling 1-877-424-1300

Direct general questions and suggestions to:
Tom Hamilton
tom.hamilton@ontario.ca
705-647–2087

For inquiries regarding content of a specific article contact the author.

***Virtual Beef* is compiled by the OMAFRA Beef Team & edited by Tom Hamilton, Beef Program Lead, Production Systems** **Ontario Ministry of Agriculture, Food and Rural Affairs**

Method

A cattle feeding budget spreadsheet (OMAFRA Beef Shortkeep, Excel*) was used to run multiple scenarios using a range of prices for 500 lb weaned calves and 750 lb stockers. Calves were assumed to be either sold at 500 lbs on Nov.1, or retained over winter and sold as 725 lb stockers on April 1. The backgrounding ration was formulated to give 1.5 lbs/day of gain. The values included in the budget are shown in Table 1. The principle ration component, good quality hay, is valued at cost of production ($50 /tonne).

Table 1. Backgrounding Budget

Item	Cost
Weaned calf price range	$1.20 - $2.00 /lb
Stocker price range	$1.00 - $2.20 /lb
Health and Vet	$20 /hd
Marketing / Trucking	$40 /hd
Yardage	$0.42 /day
Interest rate	4.0 %
Good quality hay	$50 /tonne
Corn grain	$274 /tonne
Beef supplement	$440 /tonne
Salt /mineral	$500 /tonne
Corn grain	$274 /tonne

In general, it is expected that calves will be more valuable in spring than fall, since gain on pasture is usually less expensive than feedlot gain, so grass farmers can afford to pay more. However, cow-calf producers need to be able to evaluate a wide range of prices for both calves and stockers. For this evaluation, fall calf prices ranged from $1.20 / lb to $2.00 /lb. The corresponding spring stocker prices were set as the range from a negative price margin of -$.20 /lb to a positive price margin of +$.30 /lb. For a particular series of calculations, fall 500 lb calf price was fixed, and spring 725 lb stocker price was varied from $.20 /lb less than calf price to $.30 /lb more than calf price.

The outcome of interest in this study was the **Net Margin** resulting from the various combinations of fall calf and spring stocker prices. This value represents the money gained (or lost) from the backgrounding option, compared with selling the calves in the fall.

Using the Net Margin Graph

To use the Net Margin graph (Figure 2), you need to first determine what price you expect to get for your weaned calves in fall. For example, you decide that 500 lb calves will sell for $1.50 /lb. Look for the corresponding line on the graph. Now you have to estimate what price you would receive for those animals if you kept them through the winter and sold them as 725 lb stockers the next spring. In this case, we estimate that those stockers will be worth $1.60 /lb. Locate that price on the horizontal axis on the graph, and draw a vertical line up until it touches the $1.50 calf line. From that point, draw a horizontal line across to the Net Margin scale. In this case, it crosses that scale at the $170 point. This means that overwintering your calves and selling them as stockers would create an additional $170 of added value per head. In these calculations, the cost of extra feed and other operating expenses have been taken into account, but not additional labour or risk.

(Continued on page 3)

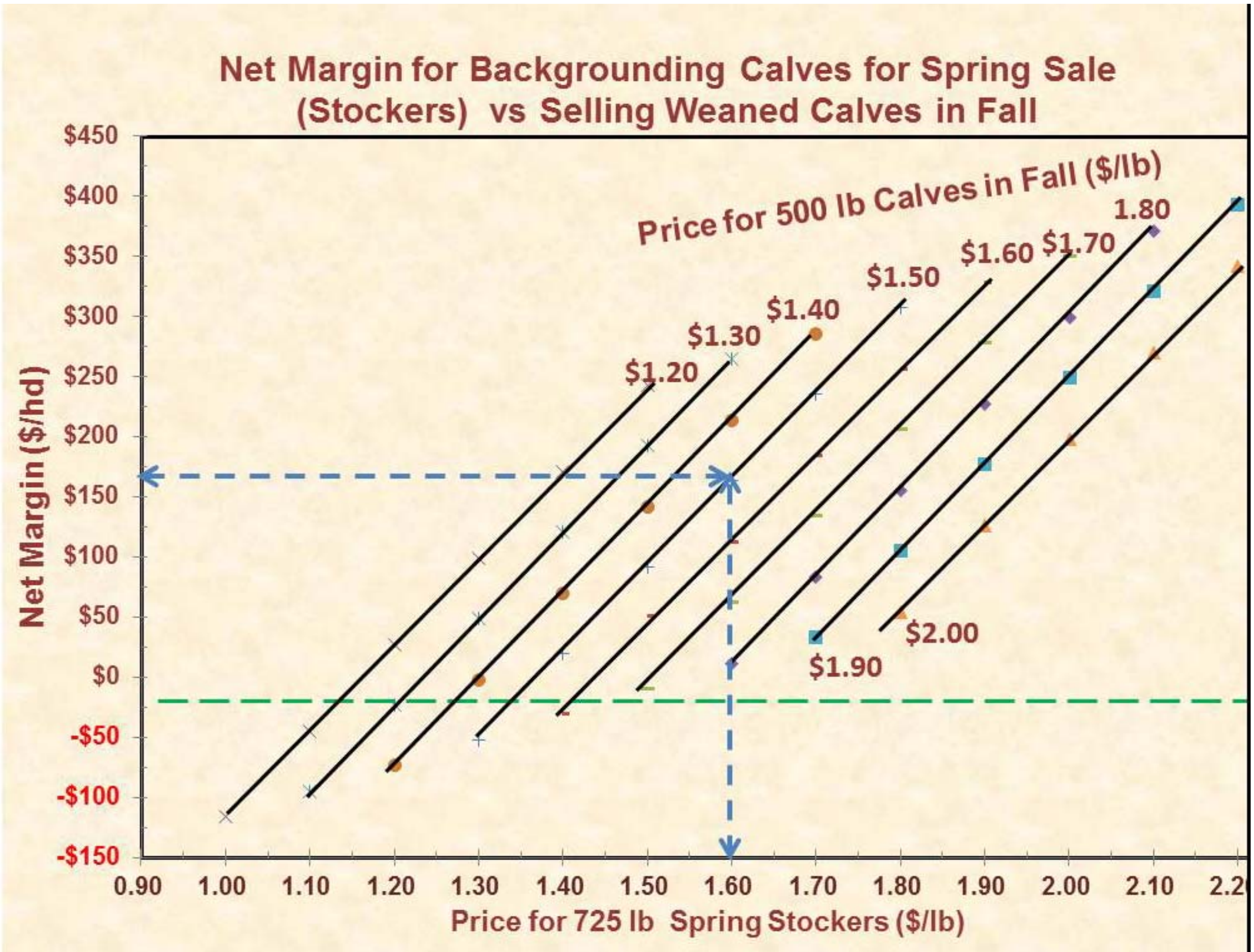


Figure 2. Net Margin for Backgrounding Calves

Over the price ranges used in this study, backgrounding was worthwhile in most instances. However, the net margin was negative when fall calf price was in the lower ranges and stocker price /lb was lower than calf price /lb. Backgrounding was profitable in each case where stocker price was greater than calf price, showing that feed and associated costs were more than covered by increased revenue. These results show that retaining calves past weaning and backgrounding them can increase total net revenue for cow calf producers.

Resources
*Budgeting tool: http://www.omafra.gov.on.ca/english/busdev/bear2000/Budgets/budgettools.htm

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

Tom Hamilton
Beef Program Lead-Production Systems
Ontario Ministry of Agriculture, Food and Rural Affairs
Tom.Hamilton@ontario.ca

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

(Continued on page 4)

A New Approach to Safer Food: Vaccinating Against *Escherichia coli* O157:H7 at the Source

Dr. Norma P. Varela, DVM, PhD, Department of Population Medicine, Ontario Veterinary College, University of Guelph; **Dr. Paul Dick**, DVM, MSc Paul Dick and Associates, Guelph, Ontario; **Kristen Simkus**, MPH, Epidemiologist for Novometrix Research Inc. and **Dr. Jeff Wilson**, DVM, Novometrix Research Inc., Moffat, Ontario, University of Guelph, DVM, DVSc, PhD

Since September, it has been difficult to ignore what the media has been calling the largest recall of beef in Canadian history, originating from *Escherichia coli* O157:H7 contamination concerns at a large meat processing plant in Alberta. The Canadian Food Inspection Agency (CFIA) reported that it was a combination of a number of deficiencies that led to the mass recall, including *E. coli*O157:H7 control measures and sampling and testing procedures[1].It is times like these that we are reminded that food safety control measures are not perfect, and we begin to ask what else can be done to ensure food safety. Large recalls like this are bound to get plenty of media attention, and may result in consumers having a negative image of the beef industry.

E. coli is a type of bacteria that is found in the digestive systems of not only cattle, but the majority of animals, including people. The majority of the strains of *E. coli* bacteria are harmless, and in fact play an important part in the digestion process. However, there are certain types of *E. coli*, including *E. coli* O157:H7, that can cause serious disease in people without causing disease in cattle. Infection in humans can occur upon consumption of contaminated food or water, or via direct contact with cattle and manure which often harbour *E.coli*. This also poses an occupational risk for individuals working with cattle, or even in animal exhibit settings, such as fairs and petting zoos. Infection with *E. coli* O157:H7 may lead to severe stomach cramps, bloody diarrhea, vomiting, and nausea[2]. Occasionally a serious condition called hemolytic uremic syndrome (HUS)can develop, which may result in kidney failure and possibly death, particularly in children and seniors.

Few farm level *E. coli* control strategies currently exist; therefore food safety is protected with a combination of post-harvest monitoring, contamination prevention, and food preparation techniques. Unfortunately, these strategies are not always 100 per cent effective, nor do they prevent *E. coli* O157:H7 from being spread into the environment prior to harvest, also known as environmental shedding. Environmental shedding may result in the contamination of drinking and recreational water, contamination of fruits and vegetables coming in contact with manure, infection via direct contact with cattle and manure, and further spread of the bacteria to other animals. In addition to this, studies have found that "super-shedders", cattle who shed high concentrations of *E. coli* O157:H7 in their feces, make up less than 10 per cent of cattle going to slaughter, but maybe responsible for over 96 per cent of the total *E. coli* O157 bacteria being shed[3,4,5].

Currently, there is no human vaccine available for *E. coli* O157:H7. However, two commercial vaccines exist for use in cattle: a type III secreted proteins vaccine (Bioniche® Life Sciences Inc., Belleville, Ontario, Canada) and a siderophore receptor and porin protein (SRP) vaccine (Epitopix®, LLC, Wilmar, MN, USA). These vaccines work by reducing *E. coli* O157:H7's ability to grow in the cattle's digestive tract, which can therefore reduce the likelihood of the bacteria contaminating food and water and infecting humans (Figure 1). One of these vaccines, Econiche™ (Bioniche® Life Sciences Inc.) is currently licensed for use in Canada.

Figure 1. A dose of *E. coli* vaccine being administered to a cow in Canada (Photo credit: J. Shea).

Recently, a group of researchers in Guelph, Ontario, conducted an evaluation of the existing studies that examined how well these vaccines work on cattle as

(Continued on page 5)

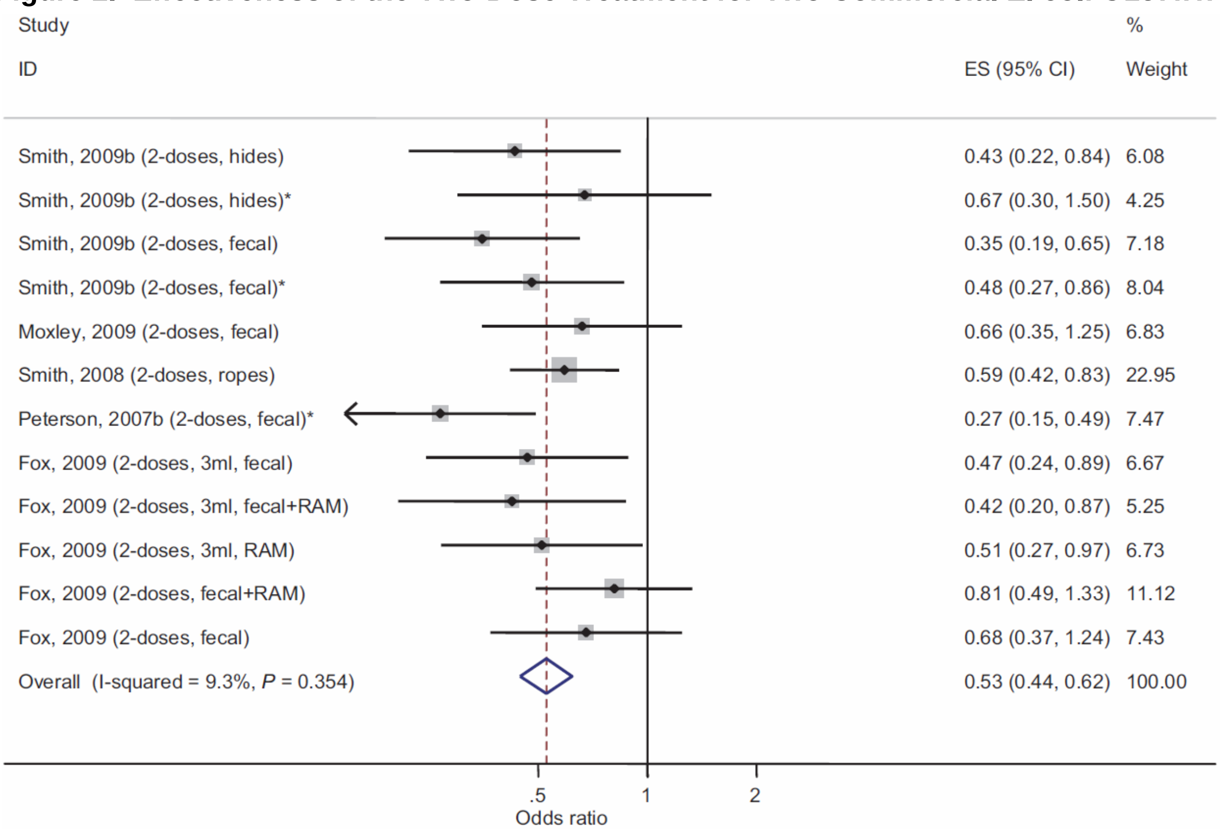
an intervention strategy before slaughter (i.e. pre-harvest)[6]. In total, 18 published studies met the three major criteria required to be included in this review. These criteria include: (1) weaned cattle in beef feedlot finishing systems under commercial conditions, (2) studies which examined the effect of a commercial vaccine on the presence or level of *E. coli* O157:H7 in cattle, (3) and randomized controlled trials. To evaluate these studies, analyses were conducted on pre-harvest outcomes, at-harvest outcomes and both pre-harvest and at-harvest outcomes combined. For study details see Supplementary section at the end of the article.

Results from the evaluation found that *E. coli* O157:H7 vaccination in cattle was consistently seen to be an effective control intervention. For example, in studies examining pre-harvest *E. coli* shedding after two doses the vaccines, there was a significant reduction in *E. coli* O157:H7 with an estimated vaccine efficacy of 47 per cent (Figure 2). This means that under these conditions, cattle that received two doses of either vaccine had a 47 per cent reduction in *E. coli* O157:H7 shedding as compared to cattle who did not receive the vaccine.

Explanation of Figure 2

- This is a forest plot of the effect of the two-dose regimen for the two commercial vaccines combined in reducing E. coli O157:H7 in pre-harvest samples.
- The solid vertical line represents an effect size (ES) of one, corresponding to no treatment effect.
- Point estimates to the left of the solid line denote a decrease in the prevalence of *E. coli* O157:H7 in each study. The farther the point estimates are to the left, the greater the reduction in E. coli O157:H7.
- The grey boxes around the point estimates denote the weight given to the study in calculating the pooled effect size; a study with a greater weight contains greater information (e.g. had a larger sample size of cattle).
- The solid horizontal lines represent the 95 per cent confidence intervals (CI), which gives us a measure of the precision around the point estimates.
- **The pooled effect size for all the studies combined is represented by the diamond at the bottom of the graph at 0.53, which equates to a 47 per cent vaccine efficacy under these conditions.**

Figure 2. Effectiveness of the Two-Dose Treatment for Two Commercial E. coli O157:H7



These study findings demonstrate the possibility of an effective multi-pronged approach to controlling the spread of *E. coli* O157:H7 to humans by targeting the disease at the source. This intervention may help reduce not only the amount of *E. coli* O157:H7 being shed into the environment, but may also reduce the risk and burden of the bacteria entering slaughter houses, possibly by "super-shedders". However, it should be noted that because the vaccines are not 100 per cent effective, and we must not dismiss the importance of ongoing food safety measures along the entire farm-to-fork continuum. Nevertheless, *E. coli* O157:H7 vaccination at the farm level appears to be an effective proactive strategy that can improve the safety of our food, protect the public's health, and reassure consumers that Canadian beef is a premium and safe product. For more information about the Guelph study, or the studies that were evaluated, please see the full article (Varela, Dick, and Wilson, 2012) in *Zoonoses and Public Health*[6]. For more information about the *E. coli* O157:H7 vaccines, please consult your veterinarian.

References:

[1] Canadian Food Inspection Agency (CFIA). (2012). Questions and Answers: Recall of Specific Products from XL Foods Inc. - Establishment 28, Brooks, Alberta. Accessed online October 3, 2012, from http://www.inspection.gc.ca/food/consumer-centre/food-safety-investigations/xl-foods/questions-and-answers/eng/1348090287501/1348090501848.

[2]CFIA. (2012). Food poisoning: *E. coli* O157:H7 - bacteria. Accessed online October 3, 2012, from http://www.inspection.gc.ca/food/consumer-centre/food-safety-tips/food-poisoning/e-coli/eng/1332539377584/1332539833416

[3]Chase-Topping, M.E., et al. (2007).Risk factors for the presence of high-level shedders of *Escherichia coli* O157 on Scottish farms.*J. Clin. Microbiol.* 45:1594-1603.

[4]Omisakin, F., MacRae, M., Ogeden, I.D., and Strachan, N.J.C. (2003).Concentration and prevalence of *Escherichia coli* O157 in cattle faeces at slaughter.*Appl. Environ. Microbiol.* 69:2444-2447.

[5]Chase-Topping, M., Gally, D., Low, C., Matthews, L., and Woolhouse, M. (2008).Super-shedding and the link between human infection and livestock carriage of *Escherichia coli* O157.*Nature Reviews Microbiology*. 6:904-912.

[6]Varela, N. P., Dick, P. and Wilson, J. (2012), Assessing the Existing Information on the Efficacy of Bovine Vaccination against *Escherichia coli* O157:H7 – A Systematic Review and Meta-analysis.*Zoonoses and Public Health*.doi: 10.1111/j.1863-2378.2012.01523.x

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

Hedging Using a Futures Put Option

John Bancroft, Marketing Strategies Program Lead, Ontario Ministry of Agriculture, Food and Rural Affairs

Hedging with a futures put option is one of the marketing tools that can be used to forward price a commodity to protect against a price movement. The purpose of using this marketing tool is to manage risk with a goal of increasing returns and/or reducing costs. Price risk can be managed, not eliminated.

A futures option is a contract you can buy and sell for a premium that gives you the right but not the obligation to take a position in the futures market. Once you have paid the premium, there are no further risks unless you choose to exercise the option and assume the underlying futures position (the risk can be limited by offsetting the position). For live cattle, the futures option is for a live cattle futures contract (underlying futures) that represents 40,000 pounds of live cattle. A good starting point is to become familiar with the following futures options trading terms.

Hedge - is taking a futures position that is equal and opposite a position in the cash market. The purpose is to manage the risk of an unfavourable price move in the future. Buying an option is a method of hedging

Put Option – gives the option buyer the right to sell the underlying futures contract at the chosen strike price on or before the expiration date

Call Option –gives the option buyer the right to purchase the underlying futures contract at the chosen strike price on or before the expiration date

Option Buyer - The purchaser of either a call option or a put option pays the premium and receives the right, but not the obligation, to enter a futures market position

Option Seller - The seller of a call or put option receives the premium and is subject to a potential market obligation if the option buyer chooses to exercise the option rights

Premium – is the value of an option contract determined by trading between buyers and sellers through a commodity exchange

Underlying Futures Contract – This is the specific futures contract that may be bought or sold if the option is exercised

Expiration Date – This is the last date on which the option may be exercised and is specified by the commodity exchange.

Strike Price – These are set out by the commodity exchange. The option buyer chooses the appropriate strike price for their marketing situation. The strike price is the price at which the holder of an option may choose to exercise their right to sell or buy the underlying futures contract

Through the bidding process between buyers and sellers on the commodity futures exchange (i.e. Chicago Mercantile Exchange (CME)); the value (premium) of the option is determined. There are different premium values for puts and calls, for each contract month and for each strike price. The premium is made up of two components, time and intrinsic value. The intrinsic value is the amount realized if the option is exercised immediately (i.e. the difference between the strike price and the current underlying futures contract market price). The time value is the amount the option's premium exceeds the option's intrinsic value. The further an option is from expiration, the higher the time value (more time available for price moves to occur).

There are three ways to manage your original option position, offset it, exercise it, or let it expire. To offset your position means to take an option position equal and opposite to the initial position (i.e. if you purchased a put option you would simply sell the put option and realize the difference between the premium values). Only the option buyer can exercise an option position. When the option is exercised, the buyer and seller are both assigned a futures position (i.e. the buyer of a put option assumes the short futures position and the seller of a put option assumes the long futures position). The option buyer would only exercise the option when it is, "in the money". If an option is "out of the money", the option buyer does nothing and lets the option expire worthless. After the option's expiration date, the option rights are no longer valid.

Besides giving the right to sell the underlying futures contract, purchasing a put option sets a minimum selling price for the commodity. For example, if a live cattle put option was purchased at a strike price of $127 per hundred weight (cwt) for a premium of $2.275/cwt, the minimum price would be $124.725/cwt (strike price minus premium and commission cost). As the underlying live cattle futures contract value moves below the strike price, the put option buyer will have the opportunity to realize a return on the option either by offsetting or exercising it. If the underlying live cattle futures contract value moves above the strike price, the put option would expire

(Continued on page 8)

worthless. The option buyer would realize the cash value of the cattle in the spot market and the cost of the premium and commission for the downside protection. Since a put option provides the right to purchase the underlying futures contract, it provides a hedge against lower prices without having to buy the futures contract and deal with margin calls.

Along with the benefit of hedging prices, put options extend the marketing window, eliminate margin requirements, do not require delivery to liquidate a position, and give the potential to gain from favourable price moves. Consideration must be given to the relevance of the premium cost compared to the protection gained and the comfort level and knowledge of the individual in using futures options.

In summary, hedging with a futures put option is one of the marketing tools that can used to forward price a commodity to protect against a movement in the price. Besides providing protection against falling prices, you can also benefit from rising prices. It is a way to extend the marketing window and work on minimizing price risk with a marketing tool that is relatively easy to enter and exit. This article provided a basic overview of a put option. A CME resource with more detailed information, "Self-Study Guide to Hedging with Livestock Futures and Options" is available at www.cmegroup.com/agriculture .

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

John Bancroft
Marketing Strategies Program Lead
Ontario Ministry of Agriculture, Food and Rural Affairs
John.Bancroft@ontario.ca

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

Is it Profitable to Pasture Yearlings?

Tom Hamilton, Beef Program Lead-Production Systems
Ontario Ministry of Agriculture, Food and Rural Affairs

Introduction

Agricultural land in Ontario is a valuable resource. Beef farmers must consider what the best option for its utilization is for their situation. If they have land that could grow annual crops, the plow may be preferred over the cow. Another option is to increase the cow herd to its maximum given the available land base (provided the number of birthings is not already the limiting factor). Or they could custom graze for other producers. The alternative which will be explored here is to use the land to pasture yearling cattle, either their own retained calves or purchased yearlings.

Compared with stored forages and grains, pasture is generally considered to be a low cost source of feed for beef cattle. With perennial pastures, the cost of equipment use for tillage and seeding is minimal over the life of the stand, and little herbicide is required. And if the legume content is significant, fertilizer costs are also low. The fact that we rely on animal power to harvest the feed and spread manure is also a plus. So using pasture as the feed for growing yearling cattle looks promising … but we have to closely examine whole budget picture. The following is intended to help producers make the best decision possible when considering whether or not to pasture yearling cattle.

Pasturing yearling steers provides an option for cow-calf producers to add value to calves they have retained, or for grass farmers who want to buy yearling cattle in spring, grow them on pasture, and then sell them as shortkeeps. The math may look easy at first glance, but we have to take into account all of the costs involved, including establishing and managing pastures, as well as animal costs such as fly tags and salt and mineral. Of course, another major factor impacting on profit is the revenue returned by the cattle. This is affected by the weight gain of the cattle as well as their off-pasture sale prices.

Method

The following economic analysis is based on a custom designed Excel spreadsheet. In this example, it is assumed that 725 lb steers go on pasture for 120 days, with an ADG of 2.0 lbs/day, and are sold off pasture at 965 lbs. Budget details are shown in Table 1.

(Continued on page 9)

Table 1. Yearling Pasture Budget*	
Item	Cost
On-pasture price range	$1.00 - $1.80 /lb
Off-pasture price range	$0.80 - $1.60 /lb
Health and Vet	$5.00 /hd
Marketing / Trucking	$40 /hd
Implant	$3.00 /hd
Fly tags	$4.00 /hd
Interest rate	4.0 %
Stocking rate	1.0 ac/hd
Seeding	$3.00 /ac
Fertilizer	$25.00 /ac
Maintenance /repair	$5.00 /ac
Cost per lb of gain	$0.43 /lb
*On wt.=725 lbs, Off wt.=965 lbs, 120 days	

Multiple scenarios were run to calculate the **Net Margin** which would result from various combinations of on-pasture and off-pasture prices. The procedure involved fixing the on-pasture price and then running a series of calculations with different off-pasture prices. The results were plotted on a graph (Fig. 1) to allow visual interpretation of the data. The resulting Net Margin values are measures of the amount of money which would be gained (or lost) from pasturing yearlings and selling them at 965 lbs, compared with selling them at 725 lbs prior to the pasture season.

Using the Decision Guide

There are three steps in determining whether you should pasture yearlings or not:

1. Determine the price per pound you expect to be able to sell your overwintered stockers for in spring (or price you will pay if you are purchasing grass cattle). For this example, we will use $1.20 /lb as the price per pound for 725 lb stockers.

2. Estimate the price that you expect to get for these animals if you pasture them and sell them in the fall. This may require a little more analysis to determine. One way to project the selling price in spring is to look at live cattle futures prices as an indication*. For this example we will predict the price for 965 lb shortkeeps in fall will be $1.15 /lb. (This is a price margin of $-0.05 /lb)

3. Use the net margin graph below to determine if pasturing yearlings are expected to produce a gain or loss.

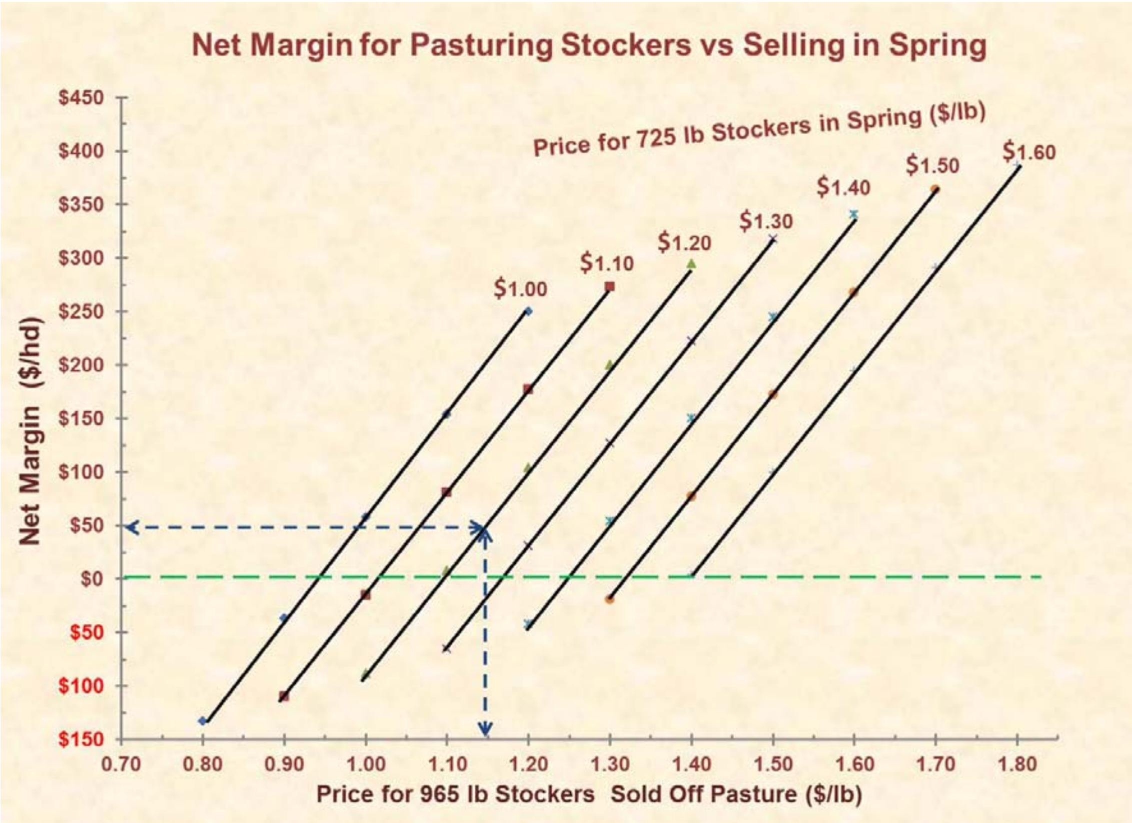


Figure 1. Net Margin for Various Price Combinations for Pastured Yearlings. Based on costs shown in Table 1.

Using the Net Margin Graph

In this example, it is expected that 725 lb spring stockers would sell for $1.20 /lb.

1. Locate the $1.20 on-pasture stocker price line (diagonal) on the graph (Fig 1).

2. Now you have to estimate what price you would receive for those animals if you place them on pasture and sold them as 965 lb shortkeeps in the fall. In this case, we estimate that those shortkeeps will be worth $1.15 /lb. Locate that price on the horizontal axis on the graph, and draw a vertical line up until it touches the $1.20 stocker line.

3. From that point, draw a horizontal line across to the **Net Margin** scale. In this case, it crosses that scale at the $50 point. This means that pasturing these yearlings and selling them in the fall would create an additional $50 of added value per head, therefore pasturing would be a profitable option.

The dotted green line on the graph indicates a Net Margin of zero, also called the Breakeven level. This occurs when the additional revenue from pasturing stockers is offset exactly by the additional costs incurred.

In these calculations, pasture and animals costs (including interest) have been taken into account, but not additional labour or risk. There can be wide variation in pasture conditions and productivity due to variables such as land type, fertilizer amount and cost, and grazing management.

Summary

In these examples, pasturing yearlings was always profitable when the margin between off-pasture price and on-pasture cattle was zero or positive [margin = off pasture price –on-pasture price]. When off-pasture price was $1.20 or greater, pasturing was profitable even when the price margin was $-0.10 or less. At an off-pasture price of $1.60, even a large negative price margin of $-0.20 resulted in a breakeven situation.

Using a decision making tool such as this can help producers minimize risk and maximize profit potential when evaluating whether or not to pasture cattle.

*Chicago Mercantile Exchange Feeder Cattle Futures
http://www.cmegroup.com/trading/agricultural/livestock/feeder-cattle.html

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

Tom Hamilton
Beef Program Lead-Production Systems
Ontario Ministry of Agriculture, Food and Rural Affairs
Tom.Hamilton@ontario.ca

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

Looking for Ration and Feed Information

The dry summer has some producers looking for options to stretch winter supplies.

Read more at Beef Feed and Ration Information

Upcoming Events

OMAFRA Feed Industry Day - November 7, 2012
A one-day workshop to provide feed industry personnel including sales staff, nutritionists and other interested professionals with timely information and tools to help their ruminant livestock clients.
program details

Farm$mart/Annual Beef Symposium - hold the date
January 19, 2013 held at the University of Guelph

Do You Know the Answer?

How many beef cows are there in Ontario?

180,400
285,100
493,700
1,178,700
1,575,900

A. 285,100