

## Washington Animal Agriculture Team Livestock Round-Up



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## Livestock Management and Health

### Malignant Catarrhal Fever in Cattle

Malignant Catarrhal (kah-TAR-ul) Fever (MCF) is caused primarily by two different herpes viruses, one found in the wildebeest as a reservoir host and one found in sheep as a reservoir host. These reservoir hosts are clinically unaffected by the virus but can serve as a source of infection for susceptible animals such as cattle, deer, bison, water buffalo and pigs, which can die from the infection.

MCF virus attacks the blood vessels in multiple organs. Clinical signs are variable and may include sudden death, high fever, diarrhea (sometimes bloody), discharge from eyes and nose and seizures. Highly susceptible species such as buffalo tend to have sudden onset of the disease with few signs of illness and rapid progression to death. Sudden death may be preceded by a depression, weakness or diarrhea. More obvious clinical signs are seen when animals survive longer. Animals with acute disease

develop a high fever and stop eating. Cattle often display cloudiness on the surface of both eyes, beginning at the periphery and progressing inward. Watery discharge from



the eyes and nose is common early in the course of the disease (Figure 1); later, this discharge contains mucus and pus, the muzzle and nostrils become encrusted and affected

**Figure 1.** Photo from Iowa State University Center for Food Security and Public Health

animals may display labored breathing and drooling. The inside of the mouth is often reddened with erosions and ulcers. The skin is sometimes reddened or ulcerated and hardened scabs may develop. In some animals, hooves may loosen or slough off. Joints may be swollen, milk production often drops and superficial lymph nodes are markedly enlarged. Blood may appear in diarrhea and urine. Occasionally, animals display nervous signs such as increased sensitivity to touch, incoordination, disorientation, involuntary eyeball jerking, tremors and/or head pressing. Although many animals die, chronic infection or recovery is possible. There is no treatment for this viral disease.

Definitive diagnosis of MCF requires laboratory testing. Antibody testing by cELISA may be performed on serum or plasma. Live animal detection of viral DNA by polymerase chain reaction (PCR) may be done on whole blood. Preferred postmortem samples for detection of viral DNA by PCR are lymph node or spleen, but other acceptable tissues include lung, kidney and intestine. Formalin-fixed tissues can be submitted for microscopic detection of blood vessel inflammation. Detection of MCF antibodies in clinically-susceptible species (cattle, bison, deer, etc.) indicates infection but is not diagnostic. Lack of antibody generally indicates lack of infection except in the very early course of clinical disease, before antibodies are produced. Therefore, PCR should be used to confirm suspected cases of clinical MCF. WSU-WADDL (Washington Animal Disease Diagnostic Laboratory) performs the MCF cELISA, the Sheep-associated MCF PCR and the Wildebeest-associated MCF PCR assay.

Although sheep are the most likely source of infection for cattle in the US, in April 2008, the USDA reported confirmatory tests diagnosing wildebeest-associated MCF in a cow from a mixed-use operation in Texas. The disease appeared to have spread to cattle from exposure to captive wildebeests. This report highlights the fact that the disease is reportable because it can look like some foreign animal diseases such as rinderpest and can also look like BVD mucosal disease or

bluetongue.

Veterinarians should be called to assess any unusual death on a farm or ranch. If cattle are showing signs of high fever or lesions in the mouth or on the feet, the veterinarian should notify the state department of agriculture. The incubation

*"MCF is reportable because it can look similar to some foreign animal diseases like rinderpest."*

period can be long in susceptible animals and dormant infection is possible. The only reliable methods of control are to separate susceptible species from carriers, or breed virus-free reservoir hosts. Most cattle are susceptible to the wildebeest form but are relatively resistant to the sheep-associated form of MCF.

MCF cannot be transmitted from cow to cow, poses no threat to human health and cannot be transmitted between people and

- Report any unusual diseases/deaths to a veterinarian or the state veterinarian
- To prevent MCF, keep cattle separated from sheep, particularly young lambs
- MCF is not transmitted between cattle
- MCF does not affect people

animals. Malignant catarrhal fever can be prevented by separating susceptible animals from sheep, goats, wildebeest or other suspected reservoir hosts. Cattle in particular should be kept separated from very young lambs, which shed large amounts of virus.

Research at the Animal Disease Research Unit at WSU documented bison are particularly susceptible to MCF. One-hundred-seventy-seven (177) feedlot bison were exposed to adolescent lambs for about 19 days. Fifty days after exposure, bison began to die. Only one of the beef cattle in the feedlot developed MCF. No bison cases were noted beyond two weeks after departure of the sheep. The distance between the bison and sheep affected mortality rates:

**Table 1.**

Distance between lambs and bison	5.2 ft	13.7 ft	16.7 ft
Mortality rate	17.5%	6.1%	0.43%

It is not common for cattle to develop the sheep-associated form of MCF. However, recent outbreaks of sheep-associated MCF in cattle in the Netherlands and Washington State call for caution when co-housing cattle and sheep. It would be prudent to avoid mixing cattle and sheep, particularly lambs actively shedding virus.

#### REFERENCES AND RESOURCES

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--adapted from an article by Dr. Dale Moore,  
WSU Veterinary Medicine Extension Director

### Washington Mares Exposed to Contagious Equine Metritis

The Washington State Department of Agriculture Veterinarian announced that at least twelve mares in the state have been exposed to Contagious Equine Metritis (CEM). Horse owners and breeders should be aware that during breeding, CEM is a highly contagious venereal disease of horses that significantly affects reproductive health. Inflammatory reactions start 24 hours after exposure to the organism. Clinical signs of the disease do not become evident until 10-14 days post-breeding when the mare short-cycles and shows signs of estrus. Most mares will not conceive when infected at the time of breeding. In the event an infected mare does conceive, the resulting fetus may be aborted

prematurely or an infected foal is carried to term.

Last December, a Quarter Horse stallion on a Kentucky farm tested positive for CEM during routine testing for international semen shipment. A total of eighteen stallions and five mares have now been confirmed positive for CEM. The exposures were primarily through co-location at breeding facilities during either the 2008 or 2007 breeding season. So far at least 750 exposed horses in 47 states have been identified during the USDA and state investigation. All the Washington mares under quarantine were recipients of artificial insemination. Other possible avenues of exposure are still under investigation. Prior to this outbreak, CEM had been eradicated in the U.S. since 1979.

The WSDA is recommending all breeding stallions be pre-screened for CEM and a health certificate accompany every shipment of cool or frozen semen. If a health certificate is not shipped with the semen, one should be available to view to verify the absence of the organism prior to breeding the mare. Mares may become infected through exposure to the disease by either natural breeding or artificial inseminations. The disease can be spread among stallions during the collection of semen, if strict biosecurity measures are not maintained. There is no human health risk associated with CEM.

More information on CEM is available on the Washington State Animal Health website at: <http://agr.wa.gov/FoodAnimal/AnimalHealth/>. Washington horse owners enrolled in the National Animal Identification System or the Washington State Animal Identification System are receiving communications from WSDA State Veterinarian, Dr. Leonard Eldridge, about the status of the disease investigation nationally and within Washington.

--S. M. Smith  
WSU Grant/Adams Area Extension

## Swine Influenza Concerns for Swine Producers and 4-H/FFA Swine Projects

The spread of the “Swine Flu” or Swine Influenza Virus H1N1 in Mexico, the U.S. and around the world has naturally created increased concern for individuals involved with swine production. Even though the name indicates a connection to swine, the spread of this illness has not been linked to contact with pigs. The Swine Flu virus, H1N1, is spreading from human-to-human contact transmission. To date, the virus has not been isolated in any animals (pigs or avian). The Center for Disease Control (CDC) released the following statement: “Swine influenza viruses are not spread by food. You cannot get swine influenza from eating pork or pork products. Eating properly handled and cooked pork product is safe.” Not only should producers take precaution to protect their health, but they should also make sure biosecurity practices are in place to protect their animals and keep this virus from entering the U.S. swine herds. Adult and youth producers, 4-H/FFA parents, advisors, and leaders can help protect themselves and the U.S. swine industry by implementing and maintaining biosecurity practices. If you own swine, consider the following practices to help prevent diseases from being transmitted to your animals:

- Individuals should shower and change into farm-specific clothes and shoes before entering facilities and handling swine. These farm-specific clothes and shoes should be specific to only your farm, not other farms you may visit. These clothing items should only be worn on your farm.
- Individuals exhibiting influenza-like symptoms should not have contact with the pigs for at least seven days. Individuals with symptoms should be seen by a medical provider.
- Restrict access to your facilities and to your pigs to essential individuals responsible for care of pigs.
- Prevent international visitors from entering facilities or handling pigs.
- Contact your veterinarian or the Washington State Department of

Agriculture Veterinarian if swine exhibit flu-like or respiratory illness, especially if the onset or presentation of the illness is unusual.

- ***Wash hands frequently, especially before and after handling swine.***

For more information about swine influenza virus transmission to pigs or more detailed biosecurity practices visit [www.pork.org](http://www.pork.org) or [the Pork Information Gateway](http://thePorkInformationGateway.com). The Center for Disease Control, [www.cdc.gov](http://www.cdc.gov), has information available concerning the spread of the H1N1 virus, travel advisory, and human-to-human disease prevention precautions.

-- *S. M. Smith*

*WSU Grant/Adams Area Extension*

## Save the Beetles!

Dung beetles are the most famous of the coprophagous (dung-eating) insects; they have received much attention in the United States in the last five years. Dung beetles come in a few different flavors (dwellers, tunnelers, and tumbler) and sizes (0.1-2.5 inches). Dwellers live in manure pats but don't do much digging. Tunnelers bury relatively large balls of manure under the manure pat. Tumblers or rollers build a manure ball, roll it away from the manure pile, and then bury it. Significant burial and breakdown of manure are accomplished primarily by tunnelers and tumblers, collectively referred to as nesters. Dwellers break the dung pats down in a few weeks; in contrast, tunnelers and tumblers can break down dung within hours or days. All dung beetles use the liquid portion of manure for their nourishment, but not all bury substantial amounts of dung. The larger species that are rollers are more abundant in sub-tropical climates with a prolonged warm season and relatively short periods of very cold soil in winter. Dung beetles do not do well in dry soils. However, irrigated pastures common in eastern Washington provide warm, wet conditions and high-moisture manure that is attractive to dung beetles.

Dung beetles provide more benefit than just reducing manure volume on pastures, even though this alone improves soil fertility,

water infiltration rates, and water quality. The feeding activity of dung beetles damages the larvae of horn flies and face flies that live in the manure as well. They also have been reported to significantly reduce internal parasites of livestock the eggs of which are shed in feces and hatch into larvae to grow in the manure pat.

Dung beetles are very abundant in the southern states from California to North Carolina. While there are not large populations of dung-burying species in the Northwest, there are numerous dweller beetles present throughout the season. A survey of dung-associated beetles was conducted in seven counties of Washington State during the summers of 2006 to 2008, using pitfall traps, sticky traps, and aged dung samples (Figure 2). Several dung beetle species were noted: seven dweller species (aphodiines) and one tunneler species (*Onthophagus nuchicornis*) (Figure 3).



Figure 2.

Having the spotlight on dung beetles reminds us to consider all non-target organisms when using animal health products and the potential for unintended negative effects of these

chemicals. The larvae of dung beetles are sensitive to some insecticides used for controlling external and internal parasites of cattle. These products include endectocides, anthelmintics, and ectocides. There is debate over the extent to which these products have contributed to the decline in dung beetle populations in the last half century, but we know that larval survival may be affected for 1 to 3 weeks after application. Parasiticides administered as a bolus and intended to last for several months have predictably more harmful effects on dung beetle populations. Adults are typically not affected. Last month,



Figure 3.

research results were published indicating that s-methoprene (an insect growth regulator, the active ingredient in some feed-through fly

control supplements), used at the rate sufficient to kill horn flies, would likely not negatively impact *Onthophagus* beetle populations in North Carolina cattle pastures.

The toxic impact of insecticides passed in the dung on dung beetles depends on how these chemicals are metabolized in the animal's body. An animal's metabolism breaks down these compounds over time, some more than others (Table 2). For example, once consumed by cattle, roughly 40% of the total dose of s-methoprene in the feed-through supplement passes out in the feces as unmetabolized. In contrast, fenbendazole breaks down in the animal's body to metabolites excreted in the feces and urine that are harmless to beetles.

Table 2.

Extensively metabolized (less active ingredient excreted)	Moderately metabolized (more active compounds excreted)
Fenbendazole, morantel, closantel, levamisole, diazinon	Ivermectin, pyrantel, netobimin, s-methoprene

To enhance dung degradation which, in turn, improves fly control, nester dung beetles have been successfully introduced into regions of the southern states to augment the native populations. The irrigated pastures of eastern Washington should be suitable for colonization by nester species that are adapted to cooler climates. We would like to make dung beetle

introductions in Washington State, using a species that would be able to survive the cold winters. If you have an interest in this project, please contact either Tip Hudson (509-962-7507) or Holly Ferguson (509-786-9233).

### Recommendations for preserving/conserving dung beetles

1. Treat livestock strategically based on regular fecal float analyses of internal parasites.
2. Treat cattle during cooler months when insects are less active.
3. Rotate pastures often to minimize trampling of the manure pats.
4. For external parasites, consider back rubbers, ear tags, and occasional dusts or sprays to minimize insecticide concentration in the manure.
5. Avoid using slow-release products like boluses.
6. Consider establishing a quarantine pasture to place your livestock in for a 1-2 week period after application of a wormer/parasiticide. This avoids spreading contaminated manure. Although dung beetles are active flyers and will follow the animals, the negative impact should be minimal, as the eggs deposited during the quarantine period will only be a small portion of the total population.

*Use pesticides with care. Apply them only to plants, animals, or sites listed on the label. When mixing and applying pesticides, follow all label precautions to protect yourself and others around you. It is a violation of the law to disregard label directions. If pesticides are spilled on skin or clothing, remove clothing and wash skin thoroughly. Store pesticides in their original containers and keep them out of the reach of children, pets, and livestock.*

### For more information:

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(<http://attra.ncat.org/attra-pub/dungbeetle.html>)

--*Tip Hudson*

*WSU Extension Kittitas County*

--*Holly Ferguson*

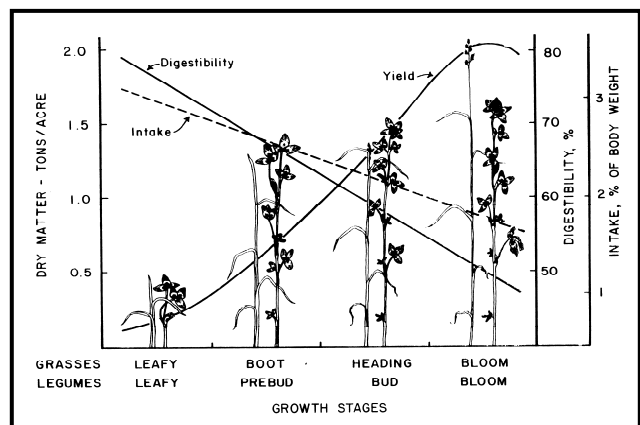
*WSU Extension, IAREC, Prosser*

# Forage Management

## Why Cut Hay Early?

The most obvious reason to cut a hay crop early is the improved nutritional quality. Other factors to consider when deciding how early to cut include alfalfa weevil populations, frost damage and bulbous bluegrass or cheatgrass infestation.

Protein content of alfalfa can easily decrease by three or more percent from the pre-bloom to mid-bloom stage, while Acid Detergent Fiber (ADF) can increase as much as five percent or more. Neutral Detergent Fiber (NDF) can increase by as much as seven or more percent. The same nutritional quality progression takes place in grasses. The



**Figure 4.** Plant growth stage and forage quality.

reason is the development of fiber in the plant as it matures (Figure 4).

The other side of the story is that total tonnage keeps increasing past when the nutritional quality really starts to drop off. So, one of the major factors in determining how early to cut is what will the end use of the hay be? What is your market? What is the price difference between top nutritional quality hay and lower nutritional quality hay? If you are feeding it yourself, what quality do your animals need and what other forage sources do you have?

Another important factor to consider in an early cutting decision is the weather risk. The alfalfa plant develops in relation to the temperature. The plant develops faster with higher temperatures and it develops slower with lower temperatures. With unsettled spring weather, sometimes the plant development can be very erratic. This is one of the times when the "art" of haymaking comes into play.

Earlier maturity hay with a little rain damage is usually better nutritional quality than later maturity hay with no rain damage. It depends on how much rain damage. If you are selling the hay, sometimes the rain damage can be more detrimental to price than the quality decrease.

Alfalfa weevils can decimate a crop's quality and yield. The alfalfa weevil is a foliage feeder. The larval stage does most of the damage. The alfalfa weevil is normally a first cuttings pest, but in some areas may cause serious damage to the re-growth with resulting losses to the second crop.

The economic threshold for alfalfa weevil control is dynamic, changing with the height of the alfalfa. Once alfalfa weevil populations reach the economic threshold level, the application of an insecticide or harvesting are the only satisfactory methods of control. Early cutting may keep the population from reaching the economic threshold.

If alfalfa is frosted during first cutting growth, the growth rate decreases and the

maturity rate increases. Because of this, sometimes the best management is to early cut after the frost damage and get started with the re-growth for a second cutting.

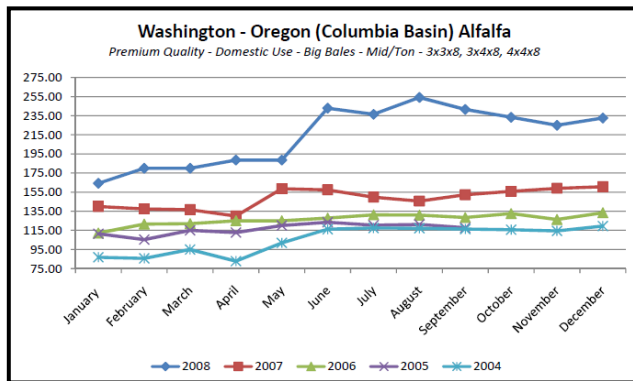
Early cutting can be an effective method of controlling grassy weeds. By cutting early, the grassy weeds will not affect the overall quality as much as waiting for the alfalfa to grow more. This also will result in a cleaner second cutting of alfalfa, because the grassy weeds won't re-grow as well as the alfalfa.

First cutting is a very stressful time for the hay producer. There are many pitfalls and hurdles to overcome, but with some knowledge of the problems and options, and a little luck, you have a better chance of getting that hay in the shed green and dry.

--John Fouts  
*WSU Walla Walla County Extension*

## **2008 Hay Market Review and 2009 Hay Outlook**

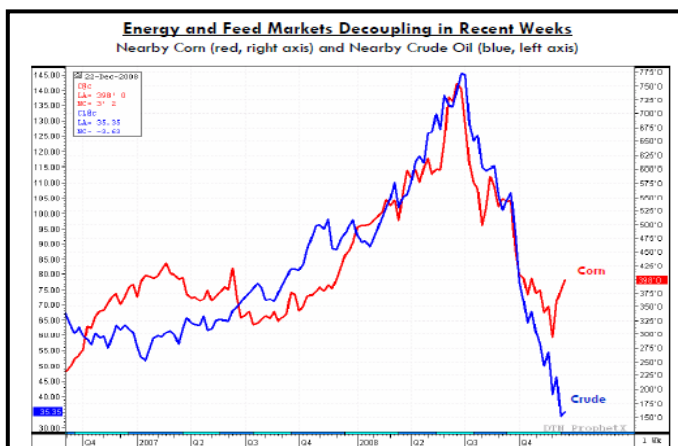
The 2008 hay market is now one for the record books in more ways than one. The record high 2008 hay prices had tremendous impacts on buyers and sellers and changed long established marketing and purchasing patterns. This article presents a 2008 market review as a basis to plan for the 2009 hay marketing year. Figure 5 shows the monthly Columbia Basin premium quality alfalfa hay price from 2004 to 2008. Typically there is a first cutting price strengthening in June. In 2008, that price jump was an unprecedented \$50 per ton and placed Washington as having the highest hay prices in the Nation. It was not uncommon to hear people reporting selling or buying hay in excess of \$250 per ton. Several factors contributed to the bid up in hay price, short hay storage stocks, a cool late wet spring which rain damaged first cutting hay, and competition for acreage from strong commodity prices resulted in decreased alfalfa acreage. According to USDA data, Washington lost thirty-thousand acres of alfalfa production from 2007 to 2008.



**Figure 5.** Columbia Basin premium alfalfa price, Source: USDA Market News

### CORN, CRUDE OIL AND GLOBAL ECONOMIC RECESSION

As we review 2008 market conditions one should note that agricultural commodities were in a price setting firestorm in the first half of the year. Corn led the price charge based on its recently established correlation to crude oil as a result of the bio-fuel ethanol market. Figure 6 shows weekly futures prices for corn and crude from 2007 to 2008. If you recall, spring 2008 corn planting was behind schedule and was threatened by mid-west flooding. Short supply fears fueled price expectations that reached a peak in June when Corn traded at a record \$7.50 per



**Figure 6.** Corn and crude nearby future contract trading price. Source: Daily Livestock Report

bushel. Crude oil was also trading at record highs and supported corn price through its link with ethanol. Crude oil futures traded at a new record of \$147 per barrel on July 7, 2008, and the U.S. average price for regular

gasoline was an all-time high of \$4.11. The crude oil price peak was a result of market conditions and mid-east political tensions from a series of Iranian missile tests. Crude oil prices fell shortly thereafter due to softening US and worldwide demand. A global financial crisis emerged in September 2008 with the failure of several large United States-based financial firms which spread to additional companies, leading to declining stock market prices and global recession. As the global economy recognized widespread recession the economic slowdown weakened exports and put downward pressure on commodity prices, including hay.

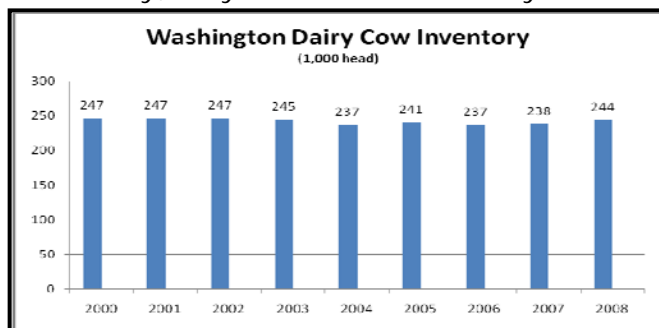
### HAY DEMAND – EXPORTERS, DAIRY, CATTLE, HORSES AND OVINE

Hay prices are set through private treaty negotiations between seller and buyer. The sellers are hay producers across the state, and buyers can be roughly grouped into exporters, dairies, beef cattle, horse and ovine producers. At the start of Washington's 2008 hay marketing year, the near term commodity price outlook was exceptionally strong as previously discussed. Hay exporters were competing against each other to secure their export supply and they bid up Washington alfalfa and timothy prices to secure their supplies. The exporters expected to sell their supply primarily to Asian export markets. However, many exporters did not have a foreign sale contract in place to offset their purchased hay. When foreign buyers discovered they could purchase their hay needs in California at a \$30 to \$40 or more price discount, many exporters were forced to lower their sale price in order to compete with the California price or lose sale volume. Export data of weight shipped for the month of January 2009, indicate that hay exports out of California ports were up 26% while hay exports out of PNW ports were down 11%. Exporters have been soft in their 2009 bids for new hay crop purchases because they overbid hay prices in 2008, some still have carry-over stocks, and the global economic recession has weakened international hay prices.

As the exporters were bidding up early season hay, the dairy industry was forced to

respond. The dairy industry has an inelastic hay demand from a need to secure year round consistent high quality hay for its nutrition program. A review of the dairy industry hay demand needs to start in 2007, when the dairy industry had exceptionally strong milk prices primarily supported through expanded milk product exports. Washington mailbox milk prices were above \$20 per cwt through most of the second half of 2007. Milk prices remained high in 2008 through the start of the year and into the start of the hay marketing season. In response to strong 2007 milk prices dairies expanded cow numbers. As shown in Figure 7, dairy cow inventory increased 6,000 head from 2007 to 2008.

At the start of the 2008 hay market season, dairies were selling milk at relatively high prices, they had expanded cow inventory, they have an inelastic hay demand



**Figure 7.** Washington dairy cow inventory.  
Source: USDA NASS

and corn prices were trading at record highs, so many established hay contracts at \$250 dollars per ton or more for their production year. Unfortunately, milk prices started declining in July and when the global financial crises hit in September, dairy exports fell and milk prices crashed though the end of the year and into 2009. It is expected that 2009 will be among the most financially challenging years on record for dairy farms. The National Milk Producers Federation, Cooperatives Working together has announced a dairy herd retirement program, to remove cows from production to address the industry's oversupply of milk production. Bids for the herd retirement program are being accepted until May 1, 2009. This is a national program and it is not expected to exert concentrated

effects in the Pacific Northwest.

A somewhat new short-buying strategy for some dairies emerged in response to the 2008 high hay prices. High prices and low profitability forced some dairy producers to purchase short-term volumes of hay because of cash flow constraints. These dairies were rewarded in the market because they avoided contracting large volumes at record high prices and were able to purchase lower priced hay through year end and into 2009. This has implications on the 2009 hay outlook as the dairies have been hesitant to move in aggressively to lock in 2009 hay contracts as some dairies felt they paid too much for hay in 2008, and recognize the success of short buying strategy which is having a dampening effect on new crop hay prices.

Beef cattle, horse owners and ovine producers had to compete in the same hay market. All 2008 hay types and quality classes were selling at record high levels. Beef cattle are in the same position as dairy concerning a financial profitability squeeze. Many beef producers locked in high hay prices in early to mid-summer for winter fed only to sell their fall calves at historically low prices. Likewise, cattle feeders on average lost money. Many horse owners have been negatively impacted by the economic recession. High hay prices have been cited as a primary cause for the increased number of abandoned horses. Ovine producers likewise face poor profitability and are not likely to lead support to higher 2009 hay prices.

### 2009 Hay Price Outlook

The global economic recession is negatively impacting hay export demand and the profitability of livestock operations that demand hay. Carryover stocks from 2008 are forcing lower prices on both new crop and carryover hay sales. Early new hay crop growing conditions and prices are being set in California and that has an added element of competition in Washington's hay market. There is a note in the April 19, 2009 Northwest Commodity Corner report, "seeing some 2009 hay being delivered to west side dairies from Imperial Valley California". California hay news reports sales of premium

and supreme quality alfalfa selling in the \$130 to \$170 ton range. This is similar to the current prices being reported in the Columbia Basin. Table 3 reports current sale price for alfalfa hay by quality classification in the Columbia Basin for large square bales.

**Table 3.** Columbia Basin Large Square Bale Price

Hay Quality	Average Price \$ / ton
Supreme	145
Premium	137
Good	120
Fair	106

Source: USDA Livestock and Grain Market News,  
Week ending April 17, 2009  
<http://www.ams.usda.gov/mnreports/lswnwcomm.pdf>

There is still a lot of uncertainty that can impact hay prices. Weather will remain a big concern through Washington's first cutting on irrigated hay. The 2009 growing season is later than normal, but not as bad as was seen in 2008. Early season snow pack and moisture indicators appear normal to good for dryland hay production. However, it is early and changes from normal weather patterns can have a significant impact. Both buyers and sellers will have to remain aware of how weather is impacting hay yields, quality and

market prices. Another factor to keep aware of is corn price and growing conditions. 2009 corn plantings are off to another slow start and are very similar to 2008 corn planting conditions. In 2008 this caused some market concern stimulated corn price increases. However in 2009, news of corn's slow plantings did not increase corn futures trading prices. If the corn supply outlook deteriorates through the summer it would pull hay prices up. While weather and corn news are relatively easy to keep current on, the impact or recovery from the global economic recession impacts on hay prices will be harder to interpret. The export markets for hay, milk and beef are all interlinked and their outlooks are directly tied to global economic recovery. Domestically the profitability outlook for dairy and cattle is weak with low price forecasts. Weak livestock production profitability will constrain hay prices. Currently hay prices are tracking similar to the 2007 hay prices reported in Figure 5.

One factor to keep in mind is markets tend to over correct. The 2008 hay prices overcorrected on the high side and the market will tend to push early season 2009 hay prices to low. The early season low prices should bring buyers back into the market to purchase 2008 carryover stocks and 2009 new crop. This may create some opportunity for hay price improvement through the second and later cuttings and to hold hay for late season sales.

-- *Dr. Shannon Neibergs*  
*WSU School of Economic Sciences*

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**Editor: Norman Suverly**

***Please contact individual authors if you have questions on the topics covered in this newsletter. Washington Animal Agriculture Team members' contact information and publications can be found at <http://animalag.wsu.edu>.***