



# Ag Insights

*From the Desks of Your Northwest Area Ag Specialists*

Oklahoma Cooperative Extension Service - Division of Agricultural Sciences and Natural Resources - Oklahoma State University

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## **Time of Day of Harvest and Impact on Nitrate Concentration**

**Glenn Selk, Oklahoma State University Emeritus  
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Forage sorghums are used by cattle producers for summer grazing or harvested for hay. Forage sorghums can be very productive and high quality, but can also accumulate toxic levels of nitrate when stressed. Based on the assumption that the plant continues soil nitrate uptake during nighttime hours, followed by accelerated conversion of the nitrate to protein during daylight hours, previous extension recommendations have been to wait until afternoon to cut forage sorghum for hay if anticipated nitrate levels are marginally high.

To evaluate the significance of the change in nitrate concentration in forage sorghums during the day, Oklahoma State University Extension Educators collected samples at two hour intervals from 8 AM to 6 PM. Five cooperators' fields ("farm") were divided into quadrants. Three random samples, consisting of ten stems each, were taken from each quadrant at the specified interval. The samples were analyzed at the Oklahoma State University Soil, Water, and Forage Analytical Laboratory to determine the level of nitrates, in parts per million (ppm).

As expected, differences between "farms" were substantial and significant. The mean concentration of nitrate for individual farms varied from only 412 ppm to 8935 ppm. The mean nitrate concentrations across all farms were 3857, 3768, 4962, 4140, 4560, and 4077 ppm for samples at 8 AM, 10 AM, noon, 2 PM, 4 PM, and 6 PM, respectively. Remember, most laboratories consider nitrate concentrations at, or above 10,000 ppm potentially lethal. **There was much more variation between farms than between harvest times. Time of day of harvest did NOT impact nitrate concentration or proportion of dangerous samples of forage sorghum hay.** Don't be led into a false sense of security by thinking that forages cut in the afternoon or evening are safer. Source: Levalley and co-workers. [2008 OSU Animal Science Research Report.](#)

To learn more about nitrate toxicity download and read [OSU Fact Sheet PSS-2903 "Nitrate Toxicity in Livestock"](#).

# Virulent Newcastle Disease

**Barry Whitworth, DVM**  
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On May 18, the United States Department of Agriculture (USDA) confirmed the presence of Virulent Newcastle disease (vND) which was formerly known as Exotic Newcastle disease in a backyard poultry flock in California. This is the first case of vND in the United States (US) since 2002. Several additional cases have been reported since the initial case. All the cases have been in California. At the time of writing this article, no cases of vND have been reported in commercial poultry operations. Backyard poultry enthusiasts should continue to strictly adhere to their disease prevention strategies with emphasis on biosecurity.

The last Newcastle disease outbreak occurred in 2002-2003. This outbreak began in a backyard game flock in California. The disease eventually spread to commercial flocks which led to the quarantine of 19 counties in California, Arizona, New Mexico, and Texas. This outbreak led to a depopulation of 4.5 million birds from 2,700 facilities. The estimated indirect and direct cost was \$395 million according to the USDA.

Newcastle disease is one of the most important infectious diseases in poultry in the world. The virus varies from a mild form to a severe form. Chickens are very susceptible to this virus. Other domestic and wild birds may also be infected with the virus. The virus may survive and be shed for several days in exotic birds. The virus survives for several weeks in warm and humid environments. It can be found on feathers and in manure. If the virus is frozen, it can survive for a longer period of time. The virus is destroyed by heat and ultraviolet light. Several disinfectants can eliminate the virus.

The virus is transmitted by inhalation and ingestion. Birds shed the virus in their feces and respiratory secretions. Birds may breathe in the respiratory droplets or they may consume fecal material from an infected bird.

The virus is spread by movement of live birds. These may be wild birds, exotic birds, game birds, pigeons, or commercial poultry. People may unknowingly spread the virus through contaminated shoes and clothing. The sharing of contaminated equipment is a good way to spread the virus.

The time that it takes for clinical signs to appear following exposure to the virus is 2 to 15 days. Clinical signs of the disease can range from none to sudden death. The respiratory, digestive, and neurological systems are usually affected by the virus. If it affects the respiratory system, signs seen include coughing, sneezing, gasping, and nasal discharge. Other signs may include swollen eyes and head. If the digestive system is involved, birds will have a greenish diarrhea. When the neurological system is affected, signs may include muscle tremors, droopy wings, torticollis, paralysis, and circling. In extreme virulent strains of the viruses, mortality may be 100%.

The best way to prevent the disease is to prevent exposure to other birds. Producers should follow their biosecurity plan. For a detailed biosecurity plan go to [healthybirds.aphis.usda.gov](http://healthybirds.aphis.usda.gov) or check out the fact sheet *Small Flock Biosecurity for Prevention of Avian Influenza* ANSI-8301 at the local county Oklahoma Cooperative Extension Service office. A vaccine is available. The vaccine reduces the severity of the disease, but it does not prevent infection.

Humans may be infected with the Newcastle virus. The people most likely to be infected with the virus are those who have close contact with live poultry. Humans infected with the virus usually have eye infections. No human infections have been associated with the consumption of poultry.

The chances that vND shows up in Oklahoma are very low. However, backyard poultry producers must always be on guard for poultry diseases. If producers would like more information about Newcastle disease, they should contact their local veterinarian or local County Extension educator or go to the Center for Food Security and Public Health at <http://www.cfsph.iastate.edu>.

# Preparing for Planting

**Josh Bushong, NW Area Extension Agronomy Specialist**

Fall planting has started for some. More than likely most have already decided what they are going to plant, but if some are still unsure of what to plant here are a few options to consider. In addition to wheat for either pasture or grain, there are some other small grain options such as triticale, rye, barley and oats and winter canola is still a viable option especially for farms with a known weed issue.

Cereal rye and triticale can be good options for a fall grazing pasture with some early spring pasture. Both perform fairly well in sandy or slightly acidic soils when compared to wheat. Triticale is basically a cross between wheat and rye. Therefore, it might be a good balance of fall and spring forage potential. Wheat will usually still have a slight advantage to a longer spring grazing period since rye and triticale typically begin to mature earlier in the spring. Concerns are warranted if the farm is going to be utilized for wheat harvested for grain in the future as cereal rye can lead to establishing as feral rye over time.

Most producers are familiar with spring oats, but these varieties can also be planted in early fall to achieve a high yielding forage before a killing freeze. There are some winter oat varieties that can survive most winters in this region, but a harsh winter can greatly reduce stands and potential spring forage growth. Both spring and winter oats typically perform better on good ground with favorable growing conditions, as they can be more drought sensitive compared to other small grains.

Winter barely is another option to achieve good fall pasture. Barley can produce a great palatable and high quality forage, while having some drought and heat tolerance. If planted too late in the fall, other small grains like rye, triticale and wheat will have a higher probability to produce more overall forage the rest of the season.

If growing forage to graze is the main focus of your farming operation this winter, then considering other small grains could be beneficial. More than likely, wheat will still be the main forage since seed wheat tends to be more readily available. The best methods to increase fall forage potential include increasing seeding rates to 120 lb./a or more, narrow row spacing, planting early if possible, eliminating volunteer wheat and other grassy weeds two weeks prior to planting to reduced viruses, and controlling armyworms and cutworms promptly if needed.

If the farm is infested with problematic weeds, then crop rotation with canola is the most economical option to clean up the farm. As one can imagine, there are fewer chemical options to control a grassy weed in a grass crop. Other the past few decades, producers have relied predominately on a single group of herbicides called ALS inhibitors. Both sulfonylurea (i.e. Finesse, Glean, Maverick, Olympus, Osprey, PowerFlex, etc.) and imidazolinone (i.e. Beyond) herbicides belong to this group of ALS herbicides.

It has been well documented by Oklahoma State University that rotating to canola for just one year can greatly reduce grassy weed infestations by 85-95%, increase the following wheat grain yields by 10-20%, as well as increase the following wheat crop forage yield by more than 20%. When it was first introduced into the region, just over 15 years ago, the main reason to consider it was to clean up wheat fields. As some producers are starting to shift their focus on other options like cover crops, canola fits well in that train of thought too. It is a great tool to use as it can be a cover crop with a good chance of being a cash crop.

Being a large tap-rooted winter broadleaf crop, it can assist in improving soil health and rain infiltration into the soil. There are also different herbicide modes of action that can be used to control grass weeds. Even though there isn't a canola crush plant in Oklahoma anymore, there are still many local delivery points across the region. Crop rotations between a grass crop like wheat and a broadleaf crop like canola helps reduce pest pressures. Many issues, including insects and diseases, we often combat in wheat can be reduced if canola is planted.

For more information about small grain options and canola production, contact your local OSU County Educator.

# Does Stocking Density Affect Growth and Puberty Attainment of Replacement Beef Heifers?

Britt Hicks, Ph.D., Area Extension Livestock Specialist

Public scrutiny of beef production systems is growing rapidly, and cattle welfare is one of the main targets for attention. Thus, cattle producers are challenged with improving production efficiency while fostering animal well-being. Stocking density is one example of management that may impact welfare and productive efficiency in cattle operations. In spring-calving cow-calf herds, replacement heifers are weaned in the fall and exposed to their first breeding season the following spring. Hence, these heifers are frequently developed in drylot systems to facilitate feeding and management during the fall and winter. However, research has shown that raising cattle in areas with elevated stocking density stimulates stress reactions which impairs reproductive function in beef cattle. Montana research has reported that heifers developed in drylot (~118 sq ft/heifer) compared to heifers developed on native range (~1.8 acres/heifer) gained over two time more body weight (BW; ~84 vs 33 lb). However, heifers developed in drylot had greater average or resting heart rates and spent less time loafing than heifers developed on native range. New Mexico research has also shown that heifers developed in drylot had greater average daily gain (ADG, 1.52 vs. 0.58 lb/day), but reduced pregnancy rates (84 vs. 91%) compared with cohorts reared on range pastures.

Oregon State University researchers hypothesized that elevated stocking density impairs welfare and reproductive development in beef heifers. To test their hypothesis, they compared growth, physical activity, stress-related and physiological responses, and puberty attainment in heifers developed on high (drylot) or low (pasture) stocking densities from weaning until the start of their first breeding season. In this experiment, 60 Angus x Hereford heifers averaging 210 days of age and weighing 485 lb were assigned to two stocking density treatments for 182 days: drylot (~150 sq ft/heifer) or pasture (~6.2 acres/heifer). The pastures were harvested for hay prior to the beginning of this experiment, and negligible forage was available for grazing throughout the experimental period. Thus, all heifers (both treatments) were limit-fed daily a diet consisting of 8.8 lb of alfalfa hay and 6.6 lb of corn (both on dry matter basis) along with ad libitum access to water and a commercial mineral/vitamin mix.

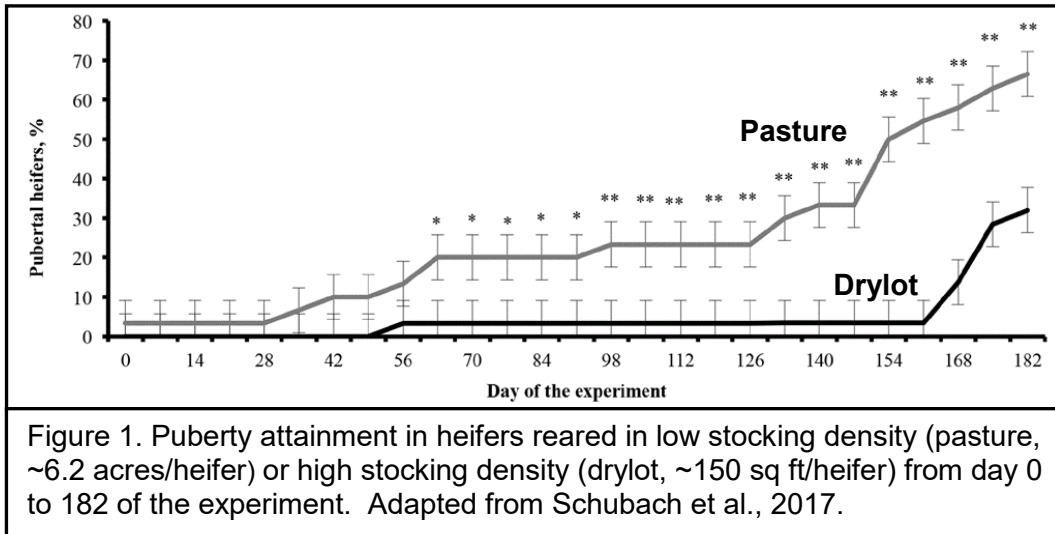
Heifers were fitted with a pedometer fixed behind their right shoulder and weekly pedometer results were recorded and blood samples were collected for puberty evaluation via plasma progesterone. On days 0, 49, 98, 147, and 182 of the experiment, hair samples were collected from the tail switch for analysis of hair cortisol concentrations. Cortisol concentration in hair from the tail switch have been validated as a biomarker of chronic stress in cattle given that cortisol is gradually accumulated in the emerging tail hair.

There were no differences between treatments for final heifer BW (786 lb) and ADG (1.71 lb/day) during the 182 day trial. However, heifers on pasture took more steps per week than drylot heifers (19,839 vs, 3,147). This outcome was expected since the pasture heifers had more space to roam. Hair cortisol concentrations were greater for drylot than pasture heifers beginning on day 98 indicating the drylot heifers experienced more chronic stress.

Drylot heifers experienced delayed puberty attainment compared with pasture heifers (Figure 1) despite their similar ADG. At the end of the trial, a greater number of pasture heifers were pubertal compared to drylot heifers (66.5 vs. 31.9%). It was reported that within heifers that reached puberty during the experiment, drylot heifers were heavier (820 vs. 703 lb) and older (363 vs. 328 days) than pasture heifers at puberty attainment.

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These authors concluded that “rearing replacement beef heifers in drylot with high stocking density negatively impacted stress-related and physiological responses, and delayed puberty attainment compared with rearing heifers in pastures with low stocking density. In addition, these results were independent of heifer nutritional status and growth rate, but were associated with reduced physical activity and increased chronic stress caused by high stocking density.” These results suggest that stocking density should be considered in heifer development programs to optimize reproductive and overall efficiency of cow-calf operations. Heifers developed in drylot may grow faster but reach puberty later than heifers developed on pasture.

# Wheat Pasture Projections for 2018

Trent T. Milacek

Northwest Area Ag Econ Specialist, OCES

Rainfall and improved drought conditions will allow producers to plan for more wheat pasture forage than has been present in recent years. To determine potential profitability, they will need to examine price outlooks for feeder cattle in the coming year.

Feeder cattle prices have been relatively flat over the past year. The current 52-week marketing channel for the October contract is trading from \$137.250/cwt. to \$155.400/cwt.; the contract tested the high and low twice over that period. Producers can view this as any price over \$146.325/cwt. being better than the 52-week channel average. The October contract is trading above \$150.000/cwt., which is a good price for cow/calf producers looking to wean calves this fall. Alternatively, cattle buyers are looking for opportunities below \$146.00/cwt. to purchase calves below the 52-week channel midpoint.

To determine the price of calves purchased in October the producer needs to know the futures price and expected basis. The expected basis, as reported by beefbasis.com, suggests that 500lb. calves will trade at \$18.53/cwt. above the October feeder cattle contract. This means 500lb. calves would cost approximately \$168/cwt., if current prices hold.

Assuming those calves gain 250 lbs. over the winter grazing season, they will weigh 750 lbs. in March. Using the same beefbasis.com data, the expected basis for 750 lb. calves is \$1.54/cwt. sold in March. The current futures bid for March 2018 Feeder cattle is near \$146/cwt. If a producer was able to lock in that price at-the-money for a \$0 marketing cost, then 750 lb. steers could be worth approximately \$147.54/cwt. in March.

To calculate value of gain, divide the difference between the selling price and purchase price of the animal by the weight gained. This value comes to \$1.07/lb. suggesting that each 100 pounds gained is worth \$107.

Producers interested in hedging March cattle could explore selling a March feeder cattle contract or buying a March feeder cattle put option. An at-the-money put option with a strike price of \$146/cwt. will cost approximately \$5/cwt. This allows the producer to take advantage of upward moves in prices but provides a floor to the March feeder cattle contract.

If a producer does not believe feeder cattle prices will improve, they can sell a March feeder cattle contract and lock in a price of \$146/cwt. If they want to establish a floor and take advantage of bullish moves, buying a March feeder cattle put option at \$146 would provide a floor of \$141/cwt. after the \$5/cwt. put option premium cost.

Prices constantly change and producers are encouraged to reach out to their local county extension educator for assistance in calculating expected prices and budgets for their own operations.

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## Use Preconditioning to Boost Returns on the 2018 Calf Crop

Dana Zook, West Area Livestock Specialist, Enid

A hint of fall is in the air which means producers who own spring calving herds are preparing to wean and ready calves for fall sales. Markets look strong in the coming season but there are programs that have historically offered a premium for calves even in times of high prices. There are many preconditioning options available for producers, however, a program with a proven track record is the Oklahoma Beef Quality Network (OQBN).

OQBN and other preconditioning programs have been designed to aid producers in making preconditioning decisions and capturing value of preconditioned calves at market. One way this is done is through the OQBN Vac-45 verification program. Cattle meeting the management and vaccination requirements are verified by Oklahoma Cooperative Extension personnel and can be marketed as

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OQBN Vac-45 cattle. Once verified, producers have the option but are not obligated to market cattle in a certified OQBN sale.

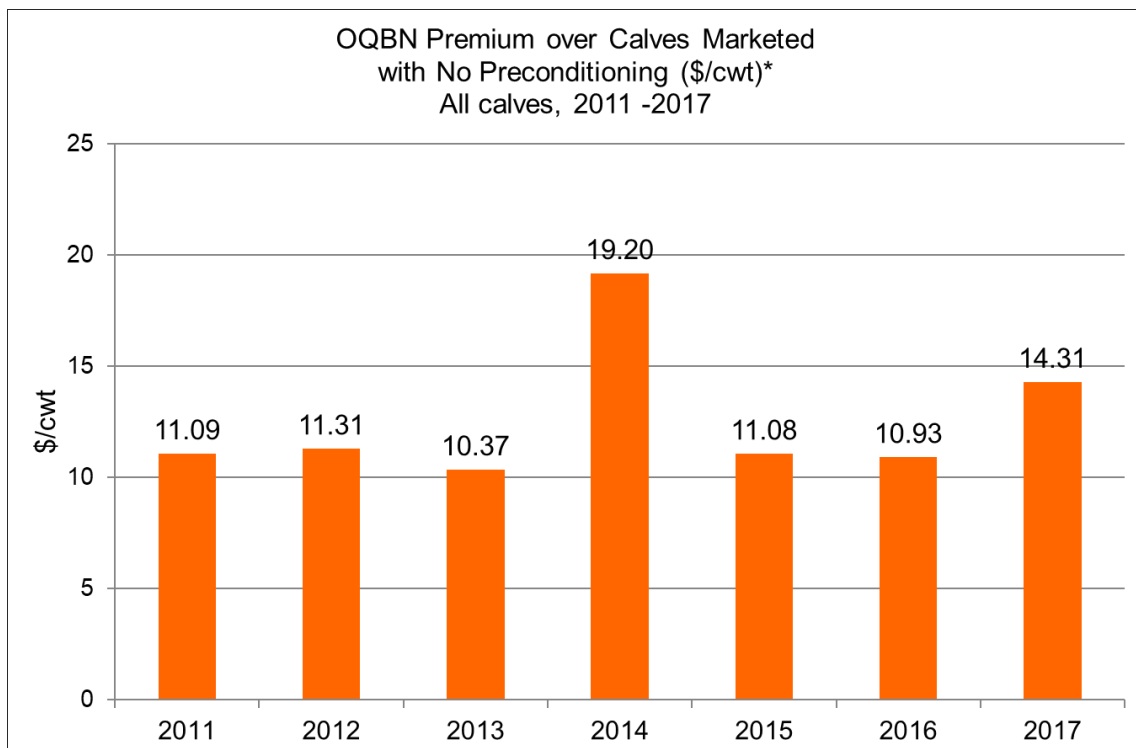
The OQBN Vac-45 program and other preconditioning programs benefit both buyers and sellers in several ways, including reduced shrink, stronger immunity, and improved weight gain during the weaning and preconditioning period. In 2017, OQBN participants realized a \$14.31/cwt premium over cattle that had no weaning or health history (see table below). Buyers offset purchase prices by having very low death loss and excellent feed conversion right off the bat.

Some producers may be apprehensive about preconditioning, however, the use of a proper vaccination protocol and the development of a basic management plan can provide healthy preconditioned calves that are more valuable at sale time.

When the decision is made to precondition cattle, producers should evaluate their feed options. What feed or grain is on hand? What is the nutritional value of the hay source? By determining feed resources and their feeding value, a basic preconditioning ration can be easily formulated by a nutritionist or OSU extension educator. According to these factors, producers should then set a target weight goal for the calves. Producers must be cautious as to not over-condition cattle that are destined for feeding environments with a low plane of nutrition such as stockpiled dry winter range or hay. In these situations, high energy diets during preconditioning will hinder future performance due to the extreme difference in nutrition.

A minimum 45-day preconditioning period is required by OQBN, however some producers may feel that 60 or 75 days works better for their operation. Rations can be adjusted nutritionally to allow for increased days on feed in turn avoiding over-conditioning situations. Finally, make sure that the preconditioning program is set in a way that requires minimal labor and equipment input. Preconditioning is an investment in risk management, however, the intention is not to accrue costs that offset premiums at sale time.

Whether headed to the feed yard or staying on the operation for winter grazing, preconditioning management paired with a full course of preconditioning vaccines will provide the producer with risk management needed to boost returns on the 2018 fall calf crop. Contact your local OSU extension educator about the OQBN program or questions about creating a preconditioning program for calves this fall.



\*Premiums calculated as difference in weighted average prices over non-preconditioned calves on same sale date.



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