COW/CALF CORNER

The Newsletter

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Meat production threatened with disruption

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The U.S. meat industry faces unprecedented threats as COVID-19 sweeps through labor forces at meat processing facilities nationwide. Production of beef, pork and poultry are simultaneously threatened as COVID-19 infections affect labor availability and processing capacity in multiple facilities across all meat industries. Reduced processing capacity could cause backups in live animal supplies if animals cannot be processed in a timely fashion. The severity of impacts will depend on specific situations and locations but could include costly delays in holding animals until slaughter, backlogs in production facilities, or even disposal of animals.

Such disruptions could result in reduced flows of fresh meat to consumers, compounded by the continuing bottlenecks created by the drastic reduction in the food service sector, roughly half of total food distribution. Since early March, those bottlenecks resulted in limited meat availability in retail grocery despite an ample supply of meat production. The next few weeks could result in continuing shortages of meat at retail grocery due to a short-run reduction in processing capacity and reduced supplies of all meats. Wholesale and retail meat prices may be pushed higher as a result of limited supply. At the same time, limited processing capacity may limit demand for slaughter animals and push farm level prices lower.

The impacts may already be showing up in the beef industry. Estimated cattle slaughter for the week ended April 11 was 536,000 head, down over 14 percent from the previous week and nearly 16 percent lower than the same week last year. The reductions include both yearling (steer and heifer) slaughter as well as cow and bull slaughter with both categories down double digits year over year for the week.

This predicament could result in a situation not previously seen in the beef industry. It may simply not be possible to slaughter animals in a timely manner. Last summer, the loss of a single packing plant in Kansas resulted in relatively little decrease in overall cattle slaughter as

production was shifted to other plants and increased Saturday slaughter largely offset the loss of the fire-damaged plant. In the current situation, closure or reduced chain speeds across multiple plants may make it impossible to keep up with slaughter.

Feedlots could be faced with slowing fed cattle finishing or holding animals on maintenance rations until slaughter can be scheduled. Cull cows and bulls may have to be held in drylots or pastures until slaughter capacity becomes available. A slowdown in feedlot marketings could result in slower feedlot placements and more feeder cattle staying on pasture. The beef industry ultimately has considerable flexibility to adjust cattle flows and timing. These responses would increase cost of production at all levels but probably would not be as severe as might result from similar disruption in pork and poultry industries where bottlenecks and backlogs are much more acute. The next few weeks could be an unparalleled challenge for livestock producers, processors and consumers.

Spring breeding seasons need to stay on time.

Glenn Selk, Oklahoma State University Emeritus Extension Animal Scientist

Spring breeding seasons need to stay on time. Traditionally spring breeding seasons in the Southern Plains begin about the first of May. Many ranches breed the yearling replacement heifers starting in mid-April, allowing the first calf heifers to have an extra 2 weeks to return to heat cycles along with the mature cows the following year. Realizing that this timing of the breeding seasons will force a few calves to arrive in late January and many calves in February, it is necessary that the breeding season is completed before extreme summer heat arrives.

Breeding seasons occurring during extremely hot weather can impact pregnancy rates in several ways.

Heat stress can have an impact by lowering the conception rate **at the time of breeding.** Florida researchers (Gwasdaukas, et al. 1973) determined rectal and uterine temperatures of dairy cows at insemination. Ranking of factors affecting conception: uterine temperature day of insemination, uterine temperature the day after insemination, mean daily temperature the day after insemination and mean daily temperature the day of insemination. An increase of 0.9 degrees F. in uterine temperature the day of insemination and the day after insemination resulted in decreases in conception rates of 12.8% and 6.9%, respectively.

Not all of the decrease in reproductive performance due to heat stress can be blamed on the female. Several research trials have been conducted throughout the years looking at the **effect of high temperatures on bull fertility.** As far back as 1963, researchers exposed bulls to temperatures of 104°F and 54% humidity for an eight hour period and then allowed the temperature to drop to 82°F with 72% humidity for the remainder of the 24 hour period. This temperature regimen was continued for seven days and was designed to resemble natural conditions in the subtropics. They found the high temperatures resulted in major detrimental effects on initial sperm motility, sperm concentration, and total numbers of sperm per ejaculate.

Fifteen years later (Meyerhoeffer, et al 1978), Oklahoma scientists placed bulls in controlled environments of 95°F for eight hours and 87° for the remaining 16 hours, while similar bulls were placed in environments of a consistent 73°F. These treatments were applied to the bulls for eight weeks, and then all bulls were exposed to the 73° environment for another eight weeks. During the treatment, the heat stressed bulls had rectal temperatures 0.9°F higher than non-stressed bulls. The percentage of motile sperm cells decreased significantly in the stressed bulls by two weeks of heat stress.

Hot weather and elevated body temperatures can have an impact on embryo survival **for at least two weeks after conception.** Research conducted several years ago at OSU illustrated the possible impact of heat stress during the second week after breeding of beef cows on their reproductive capability. In this experiment, the cows were bred naturally (after synchronization), then exposed to mild or severe heat stress. The cows were stressed on days 8 through day 16 after breeding. See the table below.

Table 1. Effects of Imposed Heat Stress on Reproduction in Beef Cows (Biggers, 1986; OSU)

Treatment group	Control	Moderate Stress	Severe Stress
Daytime temp (F)	71	97	98
Nighttime temp (F)	71	91	91
Relative Humidity %	25	27	40
Rectal temp (F)	102.0	102.7	103.6
Pregnancy %	83	64	50
Conceptus Weight (g)	0.158	0.111	0.073

All of the cows were slaughtered on day 17 and the uterine contents were studied for the presence of an embryo. Note that only half of the cows undergoing severe heat stress had an embryo present, and the conceptus (embryo + fluids and membranes) weighed half as much as did those from control cows. One cannot help but speculate that some of the underdeveloped embryos that were present in the stressed cows may not succeed in surviving until the conclusion of gestation. This severe heat stress shortly after breeding certainly had an adverse effect on embryo survivability and therefore pregnancy rates.

In each of these scenarios, heat stress, causing elevated body temperatures resulted in losses in ***percentage*** of pregnancy. None of them seemed to cause complete infertility. However, combined, these effects of elevated body temperatures can result in very disappointing breeding percentages. High pressure heat domes often occur in mid to late summer and cause triple-digit heat for several days in a row. The most severe heat stress occurs during the high pressure heat domes in July, August, and early September, when daytime high temperatures are at or above 100 degrees and nighttime lows are near 80 degrees. At this time, cattle spend very few hours in the thermal neutral environment that allows them to dissipate accumulated body heat and core body temperatures continue to be elevated.

In this region of the country, spring breeding seasons should be completed by the end of June if possible.