Increased Reports of Hydrops Pregnancies
Seeking reports of active cases

The Nebraska Bovine Congenital Defects program recently recognized an increased number of reports of hydrops pregnancies in a line of Simmental cows. Reports involve daughters and granddaughters of the bull WS All Aboard B80, ASA #2852207, and pregnancies created by embryo transfers of daughters. Not all daughters or granddaughters have had problems; in fact many daughters of WS All Aboard B80 have had normal pregnancies. A small number of these daughters develop markedly enlarged abdomens in late pregnancy due to a dramatic excess of fluid in the fetal membranes (Figure 1 and 2). The complications of pregnancy with the condition usually results in loss of the calf and occasional loss of the dam. Early pregnancy termination will save the cow. Late-stage induction and attended birth may save the cow and calf. You should consult with your herd veterinarian for final determination of how to manage the pregnancy.

Hydrops has several reported causes. There can be abnormalities in fluid metabolism in the fetus or problems in placentation affecting fluid exchange between the fetus and the dam. There is a genetic form described in Japanese Black cattle that affects the fetal kidney function.

At present, a genetic cause is suspected although the pattern of inheritance is unknown. Epidemiologic features do not suggest a recessive genetic condition. The reported cases suggest a possible dominant variant that is sex-influenced and expressed in the fetus and/or placenta (conceptus) of some female descendants. Reports also suggest the hydrops condition was transferable through embryo transfer to affect pregnancies carried in unrelated recipient dams.

Currently, there have been no cases reported on the ancestors of WS All Aboard B80, so it may be a novel mutation within this sire. At present, using WS All Aboard B80 in a terminal program where all calves are harvested will likely result in normal pregnancies with normal calf growth and health. Until a test is developed, retaining heifers from WS All Aboard B80 carries a small but yet unknown level of risk of developing a hydrops pregnancy. At this time, the frequency of transmission to granddaughters through WS All Aboard B80 sons is unknown.

The University of Nebraska–Lincoln researchers in coordination with the owners and breeder of the bull and the American Simmental Association are seeking active cases so that the definite cause can be determined. Producers with cows exhibiting symptoms should contact Bailey Abell at The American Simmental Association (406-587-4531; simmental@simmgene.com) or Dr. Steffen at the Nebraska Veterinary Diagnostic Center (402-472-1434, dsteffen1@unl.edu). ASA will arrange for sample collection and paperwork necessary to advance the research and determine solutions to attempt to prevent future cases. Samples from daughters in this line that have had multiple normal pregnancies carried to term and offspring from normal pregnancies are also of interest and serve as controls.

Typically, sampling will involve getting a blood sample in an EDTA (purple top) blood tube from the dam, and the calf if born alive. If the calf is not viable, collecting and freezing an ear for shipment is an alternative. An ear notch frozen from the cow can work, but EDTA blood is preferred. Capturing an image of the cow, and a veterinarian's report to verify diagnosis is also helpful. Parentage records of the fetus in an affected pregnancy. For a few initial cases, collection of an entire fetus or fetal placental unit will help to determine the cause of the fluid buildup. Please also identify the gender of the calf from the affected pregnancy.

The DNA sample will be used to verify parentage and see if an identifiable genetic risk factor might be determined from DNA sequencing. The ability to develop a DNA test depends, in part, on quickly notifying the ASA regarding active cases in order to gather informative samples. Getting the DNA samples is critical to this work and reporting after the calf is lost and destroyed will not advance this research. Getting an affordable test to market will allow breeders to manage their selection and mating decisions with more accurate information.

It should be noted that a growing body of evidence supports the hypothesis that a large proportion of animals carry one or more genetic mutations for unfavorable traits or conditions. These undesirable genetic variants simply go unidentified in most animals. Usually, these genetic conditions only come to light once animals are heavily used. WS All Aboard B80 was a heavily used bull due to the many beneficial attributes he possesses. It should be noted that he and his descendants still possess those attributes. The sooner a genetic test can be discovered to manage the genetic condition, the better we can progress with more informed decisions to leverage the positive attributes of All Aboard's lineage.

An example of late gestation hydrops with a dramatic abdominal enlargement and easily recognized as abnormal. Supporting structures can stretch and the lower abdomen can drop.

Early presentations may look like a twin pregnancy or a pregnant cow with moderate bloat. Veterinary examination may be necessary for early diagnosis.