



CEDAR GROVE VETERINARY SERVICE NEWSLETTER



JULY 2019

THE HOLSTEIN BREED AND ITS INBREEDING PROBLEM

There are currently around 9 million dairy cows in the US, with 94% belonging to the Holstein breed. Holsteins have risen to dominance in the dairy industry due their ability to produce a lot of milk. In 1950, for example, a single dairy cow produced about 5,300 pounds of milk a year. Through a combination of genetic selection and management changes, the average Holstein cow today produces around 23,000 pounds of milk. That amounts to around 75lbs daily in a standard 305-day lactation. In 2017, a prize-winning cow named Selz-Pralle Aftershock 3918 cranked out 78,170 pounds of milk—more than 200 pounds every single day.

It may or may not be surprising to learn that researchers at the Pennsylvania State University discovered more than 99 percent of Holstein cows can be traced back to one of two bulls, both born in the 1960s. That means among all the male Holsteins in the country, there are just two Y chromosomes. The two bulls are Round Oak Rag Apple Elevation and Pawnee Farm Arlinda Chief. They achieved this

status by outcompeting every other bull on the market.

The female side of the Holstein breed does not look much better. Holstein cows are so genetically similar that there are essentially only about 50 distinctly different genetic animals. If Holsteins were wild animals, that would put them in the category of critically endangered species. This unfortunately means that the Holstein breed in the US is fairly inbred.

Artificial insemination has allowed for the dairy industry to become safe due to farmers not having to house bulls on farm and allowed for increased genetic selection by being able to use bulls that may be many hundreds of miles away. The downside of AI is that it became increasingly more common for many farmers to all use the same bull, which began to increase inbreeding in the breed. For example, Carlin-M Ivanhoe Bell, a bull born in 1974, had more than 80,000 offspring. Most bulls have fewer, though their progeny still number in the thousands.

TEST YOUR DAIRY FARMING KNOWLEDGE

- 1) What is the general rule of thumb for determining the expiration date of milk that has been properly refrigerated?
 - a) Same as the Sell by Date
 - b) 5 days after the Sell by Date
 - c) 7 days after the Sell by Date
 - d) 10 days after the Sell by Date
- 2) How many pounds of milk does it take to make a pound of cheese?
 - a) 5lbs
 - b) 7lbs
 - c) 10lbs
 - d) 15lbs
- 3) Wisconsin is a top exported of dairy cattle genetics. How many countries do Wisconsin based AI and ET companies export semen and embryos to?
 - a) 12
 - b) 55
 - c) 81
 - d) 96

Answers on back

So, what are the consequences of this limited genetic pool? For one, it means an increased risk of inherited disorders and a reduced ability of the species to evolve in the face of a changing environment.

As previously mentioned, Carlin-M Ivanhoe Bell was used as a sire for a lot of daughters and his father, Penstate Ivanhoe Star, was also popular for breeding as his son gained popularity. However, In the 1990s, dairy farmers around the world started noticing calves being born with serious vertebrae problems that didn't survive outside the womb. Around the same time, there were a lot of

calves were being stillborn with a condition called bovine leukocyte adhesion deficiency. It turns out Star, and his prolific son had problematic recessive genes that didn't come to light until a few generations of inbreeding.

There are also potentially traits that Holstein cows may have had in the recent past, that have been completely lost due to breeding for other traits. Loss of traits can be significant since increased improvements of the breed will be harder to come by as genetic diversity decreases. Fertility rates are affected by inbreeding, and already, Holstein fertility has dropped significantly. Pregnancy

rates in the 1960s were 35 to 40 percent, but by 2000 had dropped to 24 percent.

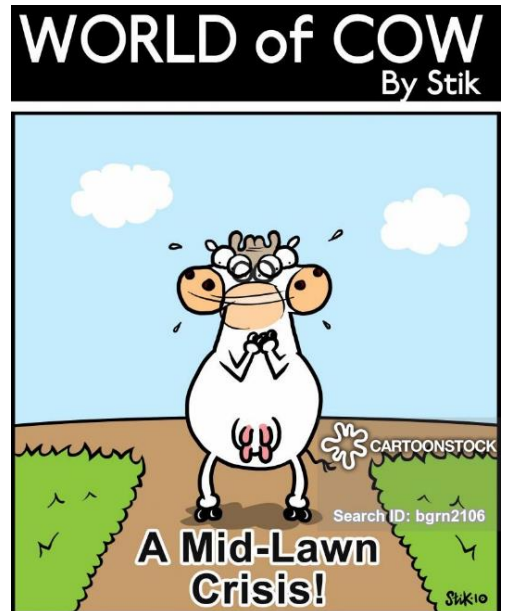
What is to be done about the inbreeding problem? Well that is a hard question to answer. Farmers are already facing enough financial hardships that preserving genetic diversity in the Holsten breed is likely not at the top of their priorities. The best that can be said is that pursuing bulls that increase genetic potential of the herd is great, but that is also fine to choose average bulls or less popular bulls. Also, the use of cross-bred dairy animals may prove to be also beneficial in adding some genetic diversity back to the breed. Overall, it is a problem that we as an industry will have to face in the future.

A Note from Dr. Michael Demianiuk

With mixed emotions I'm announcing my upcoming retirement as of July 1st, 2019. After 39 years of practicing at the Cedar Grove Veterinary Clinic, I have decided to pursue some of my other life's dreams. The exceptional staff and clients of our clinic have provided me with many years of professional fulfillment and grateful personal friendships. As many before me have stated, it's the personal relationships with our wonderful clients that are going to be missed the most. Thank you all for having the confidence in me and the terrific staff of the Cedar Grove Veterinary Clinic to be able to provide you with the veterinary needs of you animals, whether large of small. In the future, you may still see me in the clinic as I attempt to assist with transition of our new associate, Dr. Nicki Schaetzel into our clinic family. Please welcome her as you may see her providing care.

Thank you and forever grateful,

Dr. Michael Demianiuk



Dairy Farming Knowledge Answers
1) B 2) C 3) D