Animal science challenge #1

Most cattle have the ability to grow horns. These horns can be dangerous to other cattle in the herd, as well as the humans that care for them. Dehorning cattle can be an expensive and tedious process and isn't always effective as a permanent solution. How might you produce cattle without horns?

Animal science challenge #2

In order to produce milk, cows need to have a calf each year. However, having calves takes time and interrupts the production of milk. How can we extend the milking cycle of cows to reduce the number of pregnancies needed in their production cycle?

Animal science challenge #3

Lactose intolerance from milk is common in humans. This intolerance is associated with the sugar found in cow's milk. How might we produce cows that do not produce lactose in their milk? Or how can we make lactose more tolerable to humans?

Animal science challenge #4

Fatty liver disease is the accumulation of excessive fat in a ruminant animal's liver. It is especially common in cows during calving time, and without treatment it can affect the healthy development of the calf and milk production. How might you produce a cow that is resistant to fatty liver disease?

Animal science challenge #5

Histidine is an essential amino acid for swine, which means it cannot be synthesized by swine at an adequate rate to meet their maintenance, growth and reproductive needs. How might we increase the rate of histidine production in sow's milk to support the health of their piglets?

Animal science challenge #6

Jersey cattle are known for producing milk at a lower volume but with higher butterfat content than other dairy cattle breeds. This milk has a higher profit margin per volume than the milk of other breeds that produce a high volume, lower butterfat content milk. How might you produce a cow that can deliver a higher volume AND higher butterfat content milk?

Animal science challenge #7

Cattle produce gases as a natural byproduct of fermentation as they digest their feed. These gases are partially composed of greenhouse gases which may be considered bad for our environment. How might you reduce the production of greenhouse gases in cattle from fermentation?

Animal science challenge #8

Mastitis is an infection that occurs in a cow's udder, causing inflammation and reducing her ability to produce high-quality milk. How might you produce a cow that is resistant to mastitis?

Animal science challenge #9

Highly pathogenic avian influenza (HPAI) is a highly contagious viral disease that impacts wild and domesticated birds in the United States. Egg producers have taken many measures to increase the biosecurity of their farms in order to keep their chickens safe. How might you increase a chicken's resistance to HPAI?

Animal science challenge #10

African Swine Fever is a highly contagious viral disease affecting domestic and wild hogs. How might you help protect domestic hogs from this disease whose mortality rate can reach 100%?

Animal science challenge #11

The use of antibiotics in the livestock industry has raised concerns worldwide for increasing levels of antibiotic resistance that are available to all populations. How might we decrease the need for antibiotics in pork, beef and poultry?

Animal science challenge #12

Porcine periweaning failure to thrive syndrome (PFTS) is a clinical condition characterized by anorexia, lethargy, and progressive debilitation of pigs occurring within the first three weeks after weaning. How might you improve the health of piglets and reduce the rate of PFTS in this population?

Animal science challenge #13

Corn is a crop used to feed cattle. It requires the addition of nitrogen to reach its full potential. Soybeans are legumes and have a symbiotic relationship with Rhizobia bacteria, so they do not need added nitrogen. How might scientists create corn that is a legume and reduce the need for added nitrogen?

Animal science challenge #14

Silage (partially fermented plant material) is important in a steer's diet. Most silage is composed of a partially-dried whole corn plant that is chopped up and stored in a sealed container to create an anaerobic environment. The process of maintaining this environment requires extra resources and drives up cost. How might we create a fermented feed ration for cattle that does not require an anaerobic environment?

Animal science challenge #15

Hens are necessary in the poultry industry for egg production for consumers. How might you increase the female chick (pullet) hatch rate over the male chick (rooster) hatch rate?

Animal science challenge #16

Domesticated hogs are typically housed together to help improve biosecurity measures, improve air quality and facilitate manure removal. How might you breed a lean hog that is best suited for community housing?

Animal science challenge #17

Bovine respiratory disease (BRD) can impact the overall health of calves, including reduced growth rates and decreased milk production as they age. How might we breed for calves that are more resistant to BRD?

Animal science challenge #18

Colostrum is the first milk a dairy cow produces after giving birth to a calf. It is rich in antibodies that help to build up the calf's immunity to a variety of diseases. Colostrum also contains high levels of nutrients such as protein, fat, vitamins, and minerals, which are key to supporting the calf's growth and development. However, not every cow produces a high volume and/or high quality of colostrum. How might we continue to improve a cow's colostrum production (volume or quality)?

Animal science challenge #19

Hens produce eggs at a very fast rate, as often as every 25–27 hours depending on the chicken's genetics. How might you increase the rate of egg production per chicken to 22–24 hours?

Animal science challenge #20

As the calcium for the eggshells stems from the hen's own body, the majority of laying hens suffer from osteoporosis. How might you increase a hen's ability to retain calcium while still producing a strong egg shell?