

## What Does it Take to Make a Cow Float?

The cream always rises to the top. And at Kansas State University we're talking about the whole cow. Although this ice cream float isn't nutritious, it's healthy — for the cow.

At K-State's Veterinary Medical Teaching Hospital vets are treating sick cows by suspending them in water. It's a more effective type of physical therapy.

Here's how it works: Bossy is sick, is lying down and doesn't want to get up. This is bad for cows. Because of their weight, cows which won't stand can die. Their heavy body weight stresses their muscles and nerves. Although Bossy is heavy, in water she is buoyant and floats like a beach ball. Enter Aqua Cow.

The Aqua Cow Rise System is a portable swimming pool custom made for a cow. The system is effective because it takes weight off the cow's injury but keeps her up and using the affected area and other muscles, said David Van Metre, assistant professor of agricultural practices.

The tank, which holds up to 850 gallons of water, is towed near the injured cow. It is maneuvered so it sits on the ground. The doors at both ends are removed and a ramp is placed at the back. Workers slide the cow onto the accompanying rubber mat. A chain is hooked to a tractor and the mat to pull the cow into the tank.

Getting well is a full-time job for Bossy. She must float for six to eight hours a day for four to six days. This helps get her back on her feet.

K-State got its Aqua Cow from a private donor. Van Metre believes K-State is one of the few places in the nation offering the technique. This therapy has developed in the United States during the last five years. Similar tanks have been used to treat sheep, pigs and goats.

"When a cow has a problem, we always correct the cause to the best of our ability and then use the tank to help the cow stand and prevent bedsores, muscle compression and other problems," Van Metre said.

The system has an average success rate of 90 percent. This varies with the injury's severity and excludes catastrophic injuries such as those to the spinal cord.

"This system works for cows like aquatic rehabilitation does for humans. A cow can avoid putting excess strain on the injury, yet move around enough to begin regaining normal strength and function," Van Metre said. "Even range heifers that are not used to seeing people remain calm in the water."

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An Aqua Cow Rise System, or portable pool, is being experimented with at Kansas State's veterinary hospital with successful result...

## Vaccine May Be Near to Prevent Liver Abscesses

A prime cut of steak would be an even better treat for dinner if it were less expensive.

One reason for the high cost of beef production is liver abscesses. Liver abscesses slow weight gain and are a major cause of liver condemnation. The greatest economic effect is reduced animal performance. Abscesses lead to reduced feed intake, decreased feed efficiency and decreased carcass dressing percentage.

In response to these problems, Kansas State University faculty members recently began field research on a vaccine against the primary causative agent of liver abscesses. Although the vaccine has been patented, it must succeed in field tests before it is licensed.

"We made an agreement with Mallinckrodt, an Illinois animal-health company, to fund the research. If the vaccine works well in the field, they will produce and sell it," said T. G. Nagaraja, professor of animal science. "If everything goes well, the vaccine could be available commercially in 12 to 18 months."

Currently, the greatest problem with liver abscesses is in feedlot cattle on a high-grain diet, which increases stomach acid and induces inflammation of the ruminal wall. In this state of increased susceptibility, opportunistic bacteria invade and create ruminal abscesses. From these abscesses, bacteria leak into the blood and flow to the liver. Here they multiply and eventually create liver abscesses.

Numerous studies have concluded that *Fusobacterium necrophorum*, a ruminal bacterium, is the primary cause of liver abscesses. The bacterium produces a protein called leukotoxin, which kills white blood cells, the first line of defense against infections, in the body.

Presently, the most common method of liver abscess prevention is feeding cattle low levels of antibiotics. One of the antibiotics is tylosin. Studies have shown tylosin to inhibit *Fusobacterium necrophorum* in the rumen. Nagaraja said the vaccine being tested will be injected under the skin. Antibodies produced by the animal will have their effect in the liver.