



Stouffer is pictured using ultrasound to evaluate the body composition of a cow in Vera Cruz, Mexico in June 2002.

Dr. James Stouffer, Professor Emeritus

...a pioneer in the use of ultrasound
for animal evaluation

By: Melanie Soberon
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In 1958, James Stouffer, professor emeritus in animal science at Cornell University, was inspired to apply ultrasound technology to animal evaluation. Since this phenomenal undertaking, he has spent the last 40 years developing and refining the use of ultrasound in modern feedlots, processing plants and in countless applications within the realm of animal science throughout the world.

Stouffer's interest in animal agriculture began at a young age - he grew up on a 50 cow dairy farm in Sterling, IL, where his father started a dairy processing plant in the basement of his home. He remembers bottling the milk to deliver to homes in Sterling and Rock Falls along with fresh picked strawberries from their strawberry bed. For the first eight years of his schooling, Stouffer attended school a mile away in a one room schoolhouse with 12 other children. In that school house, he received the foundation of an education that eventually led him to a professional career at an Ivy League University where he taught over 2,500 students in his meat science courses.

At Sterling High School, Stouffer was one of 120 students in his class. Although it was only eight miles away, Stouffer enjoys the memory of flying himself to school one day. Stouffer shared a love of flying with his father and brother, and as a senior in high school, he qualified to fly solo. One day, his father told him their small plane needed servicing so he propped the plane and Stouffer flew it to the airport, which was about a mile from school. His high school counselor wrote in his yearbook that year that Stouffer was the only student she knew who commuted to school by private plane.

After completing high school, Stouffer attended the University of Illinois where he worked to combine his interests into a field of study. He studied a variety of subjects including chemistry and business but it was the meats course that kept his interest and allowed him to hone in on a particular area of animal science.

“I felt meat science put everything together – nutrition, physiology, and anatomy,” Stouffer explains.

His philosophy remains that “if you find areas of interest and pursue them even though they may not seem to fit, they may lead to a very satisfactory career.”

“When I graduated from high school and was trying to decide what to do, ultrasound hadn’t even been developed yet, and here my life has been centered around ultrasound applications,” said Stouffer.

Pursuing his interests paid off for Stouffer in another way when a friend told him of another graduate student who had mentioned she’d always wanted to fly in a small plane. That graduate student, Wanda, eventually became Stouffer’s wife of 54 years. They enjoyed many fly-in breakfast dates during their time in graduate school at the University of Illinois.



The traditional method of live animal evaluation was based on a visual and fat depth measurement.

In 1956, Stouffer came to Ithaca to accept a position as Assistant Professor of Animal Husbandry in the Cornell Department of Animal Science. In that time, he describes the department as “bigger and very social.”

“Time have changed because only the husband worked then,” Stouffer said. “The wives had a club called An Hussies, named because the department at that time was Animal Husbandry. The main dairy barn was across the street and there were always children playing with kittens in the barn.

We had a lot of picnics or get-togethers or shows.”

Students and faculty dressed differently as well, usually khakis and jackets for the male students and ties for the faculty. As for the female students, at that time there were only two females in the vet school, and Stouffer said very few females were in his first meat science courses.

During his teaching, Stouffer enjoyed educating students about the many post-mortem changes that occur in meat. For example, he taught that when muscle is allowed to contract during rigor mortis, the meat will be tough. This knowledge led him to develop a method of applying a telescoping device along the back of beef carcasses to prevent the muscle contraction.

“I think what most people didn’t realize and I didn’t until then – if you stop and think about it, to extend the rear leg as is done in a traditionally hung carcass, causes the back muscles to shorten, thus decreasing the tenderness in the steaks,” described Stouffer. “Watching an ultrasound monitor, I could see the muscle moving and that’s how I noticed this.”

It was 1969 when he developed the telescoping device but soon after, another researcher at a different university discovered that using electrical stimulation could use up the energy stored within muscle to achieve a similar effect of tenderization. However, the effects were not consistent, so the electrical stimulation went out of practice. Since Stouffer's method involved stainless steel devices that had to be cleaned, which implied an extra expense to processors, the method was never widely accepted. However, he recently heard from a large firm interested in utilizing this method that he developed 40 years ago. He describes it as "an idea that was ahead of its time."

An idea that apparently came at exactly the right time was Stouffer's applications of ultrasound technology. In 1958, he came across a *Life* magazine article on using ultrasound for tissue visualization in humans, complete with pictures of the cross section of a human neck.

"I thought that if you could do that on two-legged animals, we should be able to use it on four-legged animals as well," Stouffer said.

Stouffer saw the potential for ultrasound as an objective measure of determining body composition of live animals as well as carcasses. It has also been applied for determining the number of lambs a ewe is carrying, lung abnormalities, and injuries. In 1969, he developed and patented a mechanical scanner called a Scanogram that expanded and accelerated the acceptance of ultrasound use in livestock selection by breeding companies.

Realizing the need for continued refinement of ultrasound equipment for animal applications, in 1988, Stouffer retired from Cornell and founded Animal Ultrasound Services to sell ultrasonic equipment, accessories, software for automatic image interpretation as well as to provide training for customers. He then applied ultrasound concepts to animal selection in countries throughout the world including Canada, Mexico, Brazil, the United Kingdom, Australia, Thailand, Taiwan, China and Russia. One of the technologies he has seen particularly useful has been the Carcass Value Technology system developed in 1994, that determines fat depth, lean depth and percent of lean meat in pork carcasses at a rate of 1,200 per hour. This technology has been used to determine the price paid to pork producers for 19 million hogs annually since 1998.

Stouffer says that applying ultrasound to animal evaluation has not only been his greatest contribution to animal science, but also his most satisfying work project in his professional career. He expects future ultrasound equipment to become more portable and increasingly accurate in both animal and medical fields. He also believes it should become a relatively less expensive diagnostic tool with the added advantage of no radiation compared to other diagnostic equipment like MRIs and Cat Scans.

Stouffer's advice to upcoming researchers is to "determine new and exciting problems, and investigate new technologies that can be applied to provide better answers."



Stouffer's 1959 ultrasound equipment.



Stouffer's ultrasound equipment today.