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Editor's Note: Photos are available for download at <http://AgEbb.missouri.edu/news>.
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***Solving the Asian carp conundrum:
Feeding jumping fish to zoo animals could be
a 'win-win solution' for zoos, environment***

COLUMBIA, Mo. – On a sunny, summer morning, a leisurely trip down the Missouri River can be like floating in a time machine. Gaze across the rolling, muddy water to the limestone bluffs that arch toward the sky, and your mind conjures visions of days gone by when the Corps of Discovery traveled this wild and untamed gateway to the West.

Today, though, this tranquil scene can be shattered quickly by a creature that neither Lewis nor Clark recorded in their journals. The silver carp, an Asiatic invader, launches itself high into the air, a fleshy missile endangering boaters and skiers.

“It’s akin to getting hit with a bowling ball,” said Duane Chapman, describing the impact of an airborne 10 to 20-pound carp. A fisheries biologist with the U.S. Geological Survey who studies Asian carp on the Missouri River, Chapman has had many aerial encounters with the fish and has even equipped his research boat with “carp guards.” “They can break your nose or knock you out of the boat.”

While the silver carp poses a considerable hazard for boaters, it and its non-jumping relative, the bighead carp, also pose an ecological hazard for native fishes, said Rob Hayward, a University of Missouri fisheries researcher.

Asian carp
add one

“Both invasive species have established themselves in most of the Mississippi River drainage, including the Missouri, Ohio and Illinois rivers, and they are having a major impact on our native fish, especially juvenile fish,” he said. “The Asian carp are in direct competition for food and habitat with native species such as paddlefish, bigmouth buffalo and gizzard shad.”

Increasing fishing pressure on Asian carp would help control populations, but few markets exist for the fish, Hayward said. “Right now, there’s not a lot of profit in harvesting these fish, so we’re looking for ways to make it more lucrative for commercial fisherman, and that’s where the St. Louis Zoo comes in.”

Hayward and Chapman are part of a collaborative team of scientists and citizens working to create a carp product to feed to zoo animals. The team includes researchers from the University of Missouri in Columbia, the St. Louis Zoo, the U.S. Geological Survey, the U.S. Fish and Wildlife Service, the Missouri Department of Conservation, the Missouri Department of Natural Resources and The Native Fish Conservancy.

“We want to make good food of bad fish,” said Ellen Dierenfeld, staff nutritionist at the St. Louis Zoo. “It’s a win-win situation.”

The zoo purchases more than 60 tons of fish to feed its animals each year. These fish are mostly marine species, such as mackerel, herring and capelin, which range in price from 30 to 70 cents per pound. Feeding carp could save the zoo money.

“While we’ll never totally replace our use of marine fish, we estimate that around 25 percent of our current fish usage could be replaced with carp,” Dierenfeld said. “This would help reduce pressures on marine fisheries and help solve the Asian carp problem.”

She added that with more than 200 accredited zoos in the U.S., the potential for Asian carp products is substantial.

Because Asian carp are too large to feed whole to zoo animals, MU food scientist Andrew Clarke has developed a “carp cake” made from raw, ground fish. Clarke said grinding the carp has advantages.

Asian carp
add two

“The ground carp still has all the nutrition of the whole fish, but by restructuring, you have better control of the nutritional content,” he said. “It also allows you to make different sizes for different zoo animals.”

Vitamin and mineral supplements could be added to the carp product, Dierenfeld added. “We wouldn’t have to feed supplements separately.”

To form the “cakes,” Clarke uses food-grade sodium alginate and calcium carbonate in a process known as cold-set binding. “The alginate and carbonate are like the two parts of an epoxy glue,” he said. “They gel the fish together without having to cook the fish.”

Clarke and Dierenfeld have experimented with the carp cake recipe, arriving at a product that holds together while maintaining palatability. Currently, researchers are analyzing the product for its nutritional composition. By next spring, Dierenfeld hopes to begin a pilot feeding study with penguins, sea lions and pelicans.

“The birds shouldn’t have a problem with it, but the sea lions are a little pickier,” she said. “They tend to play with their food more, so texture will be important.”

Other zoos also may participate in the pilot, Dierenfeld said. Should the project prove successful, other zoo animals may also eat the fish product.

“There’s potential to feed any fish-eating critter with the carp cakes,” she said.

In addition to feeding zoo animals, Hayward said other new markets for Asian carp could be established, including fish meal for the aquaculture industry.

Both the silver and bighead carp were imported in the 1970s by U.S. fish farmers as a means of controlling algae and plankton in fish ponds, Hayward said. By the 1990s, the carp had escaped impoundments and established themselves in the wild.

Though the exact reason is unknown, Hayward said it is believed that silver carp jump out of the water as a flight response when disturbed. While the hum of a passing motor boat often sends the fish skyward, Chapman said he has seen carp jump at the shadow of a great blue heron.

Earlier this month, the U.S. Fish and Wildlife Service published a proposed rule to the Federal Register that would ban the import and interstate transport of live silver and largescale silver carp. Public comment on the proposal will remain open until Nov. 6.

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