It is, he said, a "sign of unnatural pollution."

Borrello spoke of the increase in ammonia and phosphorus in the river, and the low oxygen levels.

In the last several years, the livestock in the area has increased by more than 33,000 animals and that equals the waste of 500,000 humans.

He also spoke how the manure is getting into the river, via drains, ditches, overspreading of manure and run-offs, as well as direct dumping.

He told of the cloudiness of the river, and the decreasing use of it for recreational purposes. He outlined as well, the increasing cost to the city - and the taxpayers - of having to treat that river water, since about 25 percent of Alma's drinking water comes from the river.

State legislators, officials from the Department of Environmental Quality and the federal government know about the problem, Borrello said.

"There's just inaction," he said. "Either there are violations or the regulations don't go far enough," he said.

The commission took no action after the presentation, but Commissioner Greg Mapes said he spoke with some cash crop farmers who are concerned about the problem as well.

"Industries wouldn't be allowed to pollute the river," he said.

Since St. Louis will be receiving water from the Alma treatment plant in about a year's time, Borrello and Keeton will take their show on the road to the next St. Louis City Council meeting.

The Morning Sun (http://www.themorningsun.com)

The Pine River in Alma is a danger to your health?

By Linda Gittleman, The Morning Sun

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The trouble with the Pine River in Alma is that it's no longer just a nuisance problem.

"It's a human health issue and it has to be treated as a health issue," said Alma College Professor Murray Borrello who, along with his students, has conducted research on the river for the past 10 years.

Borrello, accompanied by Tim Keeton, associate professor of chemistry at Alma College, outlined the pollution and degradation of the river in just the last several years when they spoke before the city commission last week.

Antibiotic resistant bacteria was one of the main topics of the presentation.

Keeton said the bacteria is believed to come from concentrated animal feeding operations or CAFOS that either dump manure directly into the ditches and tributaries of the river, or they come from run offs of the manure on their fields.

Cattle and other animals kept in close quarters are fed antibiotics to keep the spread of infections and disease down.

Large quantities of antibiotics are fed to the herds and the antibiotic resistant bacteria present in the animals become very strong.

"It has to become resistant or it wouldn't survive," Keeton said.

The problem is not unique to Alma or Gratiot County, but is happening anywhere there are large feeding lots, Keeton said.

The build up of antibiotic resistant bacteria is a huge concern because it could mean that the world would go back to the "pre-antibiotic era."

Even now, there are infections and strains of tuberculosis, for example, that are untreatable due to the heavy doses of antibiotics used.

About "50 to 80 percent of all the antibiotics are used in animals," Keeton said. "These are non therapeutic antibiotics."

Keeton said one part of the research was conducted in areas such as cemeteries or on the Alma College campus and in upper reaches of the Pine River, where there is little or no access to farm run offs or manure.

About 7 percent of the samples were identified as containing antibiotic resistant bacteria.

But "downstream from the CAFOS, the samples were 84 percent positive for the antibiotic resistant bacteria," Keeton said.

"You get it wherever you hit," he said.