From presentation given by **Fred Dolgin, M.D**., August 24, 2008, at UUFSA

…The next part of my talk will focus on the relationship between industrial farm animal production and antibiotic resistance. My experience with rural America is minimal. In the 1950s, when I attended elementary school, I remember a field trip to a local dairy farm. We drank fresh milk with our lunch on picnic tables, watched cows graze in pastures, and learned how milk was produced from cows. Over the past fifty years, raising farm animals has changed from small family farms to large industrial operations. Most of my information was obtained from a report by The Pew Commission on Industrial Farm Animal Production funded by The Pew Charitable Trusts through a grant to the Johns Hopkins Bloomberg School of Public Health. One of the school's research fellows, Jay Graham, co-authored a report titled *Antibiotic Resistance and Human Health* and spoke before the Senate Health, Education, Labor, and Pensions Committee earlier this year.

Currently large numbers of pigs, chickens, and cows are raised in closed barns. One industrial operation can contain more than 25,000 pigs, 100,000 chickens, or 10,000 cows. Feeding and watering are automated processes. Movement is restricted. Feces and urine are flushed from troughs to open cesspool holding ponds. Antibiotics are added to the feed mixture purportedly to enhance growth and therefore profit. The sub-lethal doses continually fed to animals facilitate the emergence of antibiotic resistant bacteria, which can easily spread to other animals in crowded conditions. I want to emphasize that this use of antibiotic is different than the administration of therapeutic doses of antibiotics to sick animals.

The amount of antibiotics used on farms annually is reported to be between 17.8 to 24.6 million pounds. In the U.S., 70% of the antibiotics used each year are fed to farm animals. In North Carolina, farm animals consume more antibiotics than is used to treat all humans in the United States.

These antibiotic resistant bacteria colonize the intestines of farm animals, contaminate their feces, and collect in retention ponds. Groundwater contamination can seep into aquifers and affect drinking water. There is no regulation of the treatment of animal waste. These farms produce three times the amount of manure than do humans. In addition to antibiotic resistant bacteria, runoff from these farms also contains antibiotics, hormones, pesticides, and heavy metals. Contaminated manure can be used as fertilizer for crop fields. Industrial farm workers can become infected or colonized with antibiotic resistant bacteria and transmit these bacteria to their family and neighbors. Currently these agricultural workers are not subject to federal and state industrial regulation, exposure monitoring, and injury-disease reporting.

Despite improved regulation of the meat packing industry after the publication of Upton *Sinclair's The Jungle* in 1905, contaminated meat can transmit antibiotic-resistant bacteria to workers and consumers. These bacteria may not be susceptible to new antibiotics that have been licensed for agricultural use before human use. In the European Union, where non-therapeutic use of antibiotics in farm animals has been banned, studies have documented decreasing prevalence of antibiotic-resistant bacteria in humans.

The practice of adding antibiotics and other agents to animal feed to promote animal growth is rationalized by increased profit. Recent studies found that the financial benefits to agribusinesses was minimal and could be achieved more safely by better management of animal hygiene. More importantly, the cost of non-therapeutic use of antibiotics is borne by society and not calculated in the retail price of meat and poultry. The National Academy of Sciences estimated that increased health care cost due to antibiotic-resistant bacteria was $13/person/year while eliminating antibiotics from animal feed would increase consumer cost less than $10/person/year. These studies were in 1998 and 1999.

Interestingly, greenhouse gases, such as methane, carbon dioxide, and nitrous oxide, released from industrial farm animal production facilities, especially the intestines of animals, account for 18 percent of all human-caused greenhouse gas emissions. This is more than all the cars, trucks, busses, trains, and planes produce.

The Pew Commission made six recommendations:

1. Phase out and then ban the non-therapeutic use of antimicrobials.
2. Improve disease tracking and monitoring. The goal is that a U.S. Animal Identification Number will help track food animals "from birth to consumption and include movement, illness, breeding, feeding practices, slaughter condition and location, and point of sale."
3. Improve Industrial Farm Animal Production regulation with regard to animal waste collection, treatment, and disposal.
4. Phase out intensive confinement that restricts natural movement and normal behaviors of animals. Animal welfare is an ethical issued.
5. Increase competition in the livestock market. Antitrust laws should be enforced to help restore the small and mid-size family farm, which as the basis of a thriving rural America.
6. Improve research in animal agriculture. Public funding is needed to avoid the bias inherent in research funded by giant multinational agricultural companies.

What can we do?

1. Eat less meat products.
2. Read labels and buy milk, eggs, and meat not produced with antibiotics in animal feed.
3. Become better informed and talk to others about this problem.
4. Write to legislators to increase regulation of industrial farm animal production and ultimately to ban non-therapeutic use of antibiotics in farm animals.