

Political Bans on Antibiotics are Counterproductive

European Test Case: Increased Animal Disease, Mixed Human Health Benefit

In the mid-1990s the European Union made a political decision to phase out the use of antibiotics as growth promoters (AGPs). Denmark, with a pork industry roughly equivalent to the size of the pork herd in Iowa, led the way, instituting a full voluntary ban in 1998 and making it compulsory in 2000.

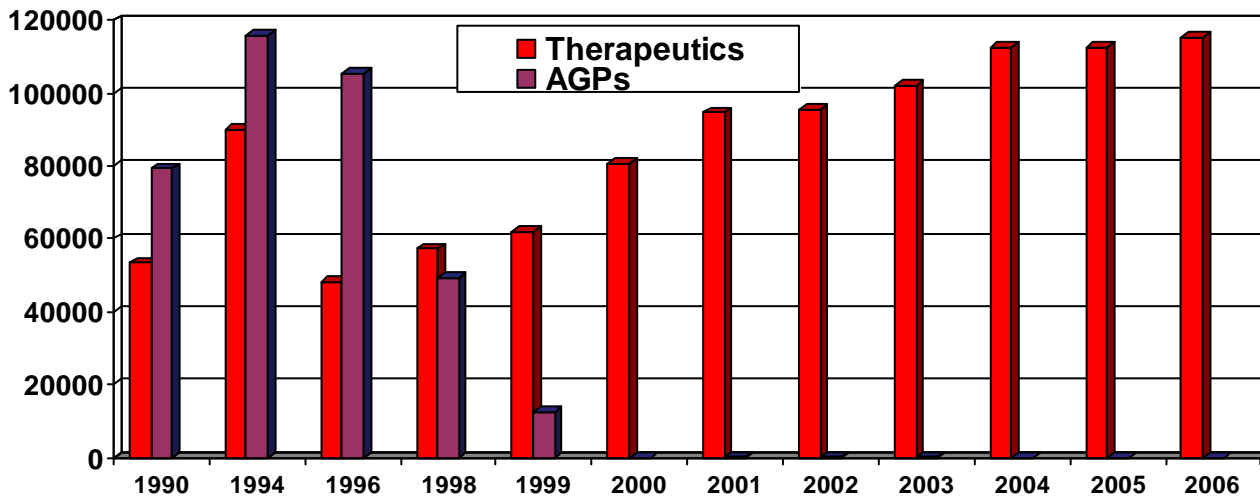
As there have been proposals in the U.S. Congress that would ban even more uses of antibiotics in animal agriculture, the Danish experience provides an instructive case study. Some consequences of the ban are clear from Danish data:

- Increased death and disease among animals
- Greater amounts of antibiotics used to treat animal disease, although overall use is still down somewhat. Total use has declined by 30 percent between 1997 and 2005, while quantities used for therapeutic purposes increased 135 percent between 1996 and 2005.
- While resistance to some antibiotics has decreased in animals, resistance to other antibiotics has gone up
- Little evidence exists to suggest that antibiotic resistance in humans has declined, which was the purpose of the ban

Bottom line: A ban on AGPs in Denmark has not had the intended benefit of reducing antibiotic resistance patterns in humans. It has had the unintended consequence of increasing animal suffering, pain and death.

Each year, the Danish Government publishes a report on antibiotic use and resistance patterns, from which the chart below is drawn. The full report for 2005 can be found at http://www.danmap.org/pdfFiles/Danmap_2005.pdf.

Antibiotic Use in Denmark, 1990-2005



Comparison of resistance patterns from the Danish data in humans and animals provide no clear correlations.

Enterococcus faecium:

Between 1997 and 2005, resistance to 4 or 5 antimicrobials in samples from pigs, pork, poultry and poultry meat declined. However, there were increases in resistance in samples from healthy humans:

- Virginiamycin resistance increased from 29 to 54 percent
- Vancomycin resistance increased from 0 to 2 percent
- Tetracycline resistance increased from 8 to 16 percent.

E. coli

In pigs, resistance to ciprofloxacin increased from zero in 1997 to 3 percent in 2004 and declines to less than 1 percent in 2005

In humans, resistance to ciprofloxacin among *E. coli* urine isolates from primary health care increased to 4.3 percent. This increase is consistent with parallel increases in the use of fluoroquinolones in primary care and hospitals, and inconsistent with the decreased use of fluoroquinolones in food animals.

Salmonella Typhimurium

- Tetracycline resistance increased in poultry, pigs and humans.
- Ampicillin resistance declined in poultry (9 to 0 percent), increased in pigs (7 to 27 percent) and increased in humans (11 to 45 percent).
- Nalidixic Acid/Ciprofloxacin resistance declined in poultry and pigs, but increased in humans (1 to 4 percent).

Campylobacter jejuni

In chickens

- Resistance to ciprofloxacin has varied, starting at 1 percent in 1997, rising to 7 percent in 2001, falling to zero in 2002 and rising to 8 percent in 2005
- Resistance to tetracycline was 5 percent in 1996 and 2005.
- Resistance to erythromycin remained low at zero percent in 2005

In humans

- Resistance to ciprofloxacin from domestically acquired cases increased from 12-14 percent in 1997 to 28 percent in 2005
- Resistance to tetracycline from domestically acquired cases increased from 9 percent in 1997 to 25 percent in 2001, 24 percent in 2004 and 16 percent in 2005
- Resistance to erythromycin remained low at zero percent.

Coalition for Animal Health

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