Antibiotic Use in Food Animals Contributes to Microbe Resistance

Bacteria that resist antibiotics can be passed from food animals to humans, but not enough is known to determine the public health risks posed by such transmission, says a new report by a committee of the National Research Council. The federal government should form an oversight panel to ensure the appropriate use of antibiotics in animals and humans, and establish a national database to monitor microbe-related illnesses and trends in antibiotic resistance that may result from drug use in food animals.

"Using antibiotics to control and treat diseases in animals improves the safety of our food supply by providing healthier sources of meat, cheese, milk and eggs," said committee chair James Coffman, provost, Kansas State University, Manhattan. "But there have been a few cases in which resistant bacteria have been passed to people. Extra vigilance is needed to prevent the spread of bacteria that cannot

(continued on page 2)

<table>
<thead>
<tr>
<th>Broiler Performance Data (Region)</th>
<th>Live Production Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SW</td>
</tr>
<tr>
<td>Feed cost/ton w/o color</td>
<td>143.78</td>
</tr>
<tr>
<td>Feed cost/lb meat</td>
<td>14.09</td>
</tr>
<tr>
<td>Days to 4.6 lbs</td>
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<tr>
<td>Med. cost/ton</td>
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</tr>
<tr>
<td>Chick cost/lb</td>
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</tr>
<tr>
<td>Vac–Med cost/lb</td>
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</tr>
<tr>
<td>WB &amp; 1/2 parts condemn. cost/lb.</td>
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<tr>
<td>% mortality</td>
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<tr>
<td>Sq. Ft. @ placement</td>
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<tr>
<td>Lbs./Sq.Ft.</td>
<td>5.54</td>
</tr>
<tr>
<td>Down time (days)</td>
<td>13</td>
</tr>
</tbody>
</table>

Data for week ending 07/18/98.
be destroyed with currently available drugs. And agricultural producers, health care providers, veterinarians and consumers must use antibiotics properly and be aware of potential risks."

Antibiotic resistance in humans and animals has risen sharply during the last several decades, says the report The Use of Drugs in Food Animals: Benefits and Risks. Some 30 antibiotics—such as tetracycline, penicillin and streptomycin—are approved by the Food and Drug Administration (FDA) for many uses in food animals, and several of the drugs are used to treat people. Bacteria eventually develop resistance to antibiotics in many ways, such as by creating chemicals that degrade a drug's potency. Resistance can develop rapidly, and it may be transferred in bits of DNA from one bacterium to another and between different species of bacteria.

Potentially life-threatening microbes that can be passed from animals to humans include salmonella and E. coli. Bacteria are transmitted in food products or through direct contact with animals or manure. Infants, the elderly, and others with weakened immune systems are at higher risk from drug-resistant infections, as are farm workers.

A national database on antibiotic use and resistance trends should be created to provide easily accessible data to farm producers, veterinarians, doctors and other interest groups, the committee said. An oversight panel of representatives from regulatory agencies, the veterinary and medical communities, agriculture production, and consumer groups should regularly monitor information on resistance and make recommendations on how antibiotics should be used in humans and food animals. To maintain an effective supply of antibiotics, the panel would help determine whether new antibiotics should be held in reserve for medical use only, or for specific uses in animals. For example, the veterinary use of fluoroquinolones is now limited by the FDA to prescription-only use in poultry, because the antimicrobial agents could be needed to treat life-threatening infections in humans that don’t respond to other antibiotics.

The number of cases of human illnesses that can be traced to antibiotic-resistant germs in food animals is very low, the report says. However, assessing the likelihood that human diseases might be triggered in this way is difficult because critical data are lacking in areas such as sources of illness and shifts in disease rates. In addition, the majority of human diseases caused by microbes in animals are passed through contaminated food products, further complicating assessments of potential health risks. Antibiotic-resistant bacteria—or any food-borne bacteria—is unlikely to cause human illness unless the microbes are spread through improper food processing, storing, or cooking, the committee said.

Research to develop new classes of antibiotics should receive more funding, the report says, because bacteria that develop resistance to one antibiotic may become resistant to others in the same class. New drugs will be needed for both the medical and veterinary communities to ensure that alternatives are available to treat antibiotic-resistant infections. To prolong the effectiveness of existing antibiotics, public education campaigns that stress their proper use should be implemented. Resistance is more likely to occur because of misuses in human medicine, the committee said. In addition, consumers should be informed of the benefits and potential risks of antibiotics in food animals.

Drug Monitoring

The committee reviewed the major classes of drugs used for animal health, including antibiotics, antiseptics and fungicides, steroid growth promoters, and antiparasite drugs. Because of a documented increase of antibiotic resistance in human and animals, the committee focused primarily on antibiotics.

Current monitoring systems to detect drugs in milk, meat, and other food products derived from animals are adequate, the committee said. Screening and monitoring techniques should continue to be deployed to protect consumers against the possible adverse effects of ingesting residues of drugs, some of which could be toxic or lead to diseases or allergic reactions. The accuracy of testing techniques should

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Antibiotic Use in Food Animals Contributes To Microbe Resistance
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be improved to reduce the number of false-positive results that occur, especially in milk, and more resources are needed to develop testing methods for a wider range of drugs.

In certain cases and with accurate documentation, veterinarians are allowed to prescribe antibiotics to treat animal illnesses other than those specified by the FDA. To ensure that the residues of these drugs are safely reduced in animal tissue before any food products are produced, the agency should develop ranges for safe dosages and establish withdrawal times, the committee said.

Antibiotics in Food Productions
Some 60 percent to 80 percent of all cattle, sheep, swine and poultry in the United States will be given antibiotics at some point. In addition to treating specific diseases, much of the approximately 19 million pounds of antibiotics used annually in agriculture are added to feed or water to promote growth and to help prevent animals in close quarters from transmitting diseases. In these cases, antibiotics are administered in doses much lower than those required to treat specific infections. Using antibiotics in this "sub-therapeutic" way allows more animals to be raised at lower costs.

Because these animals are regularly exposed to small doses of antibiotics, any microbes they carry may be more prone to developing resistance. But it is difficult to determine whether or how low doses cause resistance, the report says, because the doses and cycles by which antibiotics are administered vary widely. More data are needed on bacteria-resistance patterns in animals that are treated with antibiotics at specific doses, and how different levels of antibiotic use in animals affect human health. Resistance should be classified by each antibiotic used, the microbes that are affected, levels of resistance, and individual dose and treatment periods.

To reduce the likelihood of resistance, some interest groups have called for banning antibiotic use in food animals for any purpose other than treating specific diseases. The Research Council committee esti-

(continued on page 4)

<table>
<thead>
<tr>
<th>Brollec Performance Data (Company)</th>
<th>Brollec Whole Bld Condemnation (Region)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Live Production Cost</strong></td>
<td><strong>SW</strong></td>
</tr>
<tr>
<td>Average Co.</td>
<td>147.87</td>
</tr>
<tr>
<td>Top 25%</td>
<td></td>
</tr>
<tr>
<td>Top 5 Co’s</td>
<td></td>
</tr>
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<td>4.15</td>
</tr>
<tr>
<td>Vac-Med. cost/lb</td>
<td>0.09</td>
</tr>
<tr>
<td>WB &amp; 1/2 parts condemnations cost/lb</td>
<td>0.28</td>
</tr>
<tr>
<td>% Mortality</td>
<td>5.97</td>
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<tr>
<td>Sq. Ft. @ placement</td>
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</tr>
<tr>
<td>Lbs/Sq. Ft.</td>
<td>6.01</td>
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<tr>
<td>Down time (days)</td>
<td>11</td>
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</tbody>
</table>

Data for week ending 07/18/98.

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Antibiotic Use in Food Animals Contributes To Microbe Resistance  
(continued from page 3)

mated that such a ban would cost consumers about $1.2 billion to $2.5 billion a year—or $4.85 to $9.72 per person—in higher prices for poultry, beef and fish. However, animal diseases might become more widespread, which could increase public health risks and lead to higher demand for antibiotics to treat sick animals. The costs of banning subtherapeutic uses of antibiotics should be weighed against consumer benefits that result from healthier farm animals.

The FDA and the U.S. Department of Agriculture approve, regulate, and monitor new animal drugs. FDA should continue to expedite drug-review approval by initiating an arbitration process to settle scientific and regulatory disputes quickly, the committee said. The agency also should review data on drugs already approved and used in other countries. Requirements for drug development and review worldwide should be uniform to shorten the approval process.

Alternatives to Antibiotics

Improved animal-management practices could substantially reduce the amount of drugs needed for food animals, the report says. More research is needed on the impact of nutrition and drug treatments to boost immune function and disease resistance in animals. For example, dietary protein hormone treatments, antioxidant vitamins, and trace elements show promise in maintaining animal immune response. In addition, new vaccination techniques also are needed to prevent the spread of diseases, the report says. Effective vaccines will reduce the demand for antibiotics.

The study was funded by the U.S. Department of Agriculture, and the Department of Health and Human Services, the Pew Charitable Trusts, the American Veterinary Medical Association, and the American Feed Industry Association. The National Research Council is the principal operating arm of the National Academy of Sciences and the National Academy of Engineering. It is a private, non-congressional charter.

Broiler Whole Bird Condemnation (Company)

<table>
<thead>
<tr>
<th></th>
<th>Average Co.</th>
<th>Top 25%</th>
<th>Top 5 Co.'s</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Septox</td>
<td>0.298</td>
<td>0.209</td>
<td>0.228</td>
</tr>
<tr>
<td>% Airsac</td>
<td>0.155</td>
<td>0.075</td>
<td>0.070</td>
</tr>
<tr>
<td>% I.P.</td>
<td>0.182</td>
<td>0.064</td>
<td>0.035</td>
</tr>
<tr>
<td>% Leukosis</td>
<td>0.021</td>
<td>0.004</td>
<td>0.009</td>
</tr>
<tr>
<td>% Bruise</td>
<td>0.016</td>
<td>0.009</td>
<td>0.006</td>
</tr>
<tr>
<td>% Other</td>
<td>0.045</td>
<td>0.021</td>
<td>0.032</td>
</tr>
<tr>
<td>% Total</td>
<td>0.719</td>
<td>0.383</td>
<td>0.380</td>
</tr>
<tr>
<td>% 1/2 parts condemnations</td>
<td>0.416</td>
<td>0.316</td>
<td>0.330</td>
</tr>
</tbody>
</table>

Data for week ending 07/18/98.
Excerpts from the latest Economic Research Service and National Agricultural Statistics Service USDA Reports

"Livestock, Dairy and Poultry Situation and Outlook (ERS)"
"Broiler Hatchery" and "Chicken and Eggs" (NASS)

Broiler Prices Increasing
According to Economic Research Reports (ERS) wholesale prices for whole broilers increased more than 10 percent between late May and early July to nearly 5 cents above last year. Extremely hot weather has probably slowed growth rates for broilers in some leading southern production areas. This has been reflected in weekly slaughter, with recent reports showing live weights about 2-percent lower than a year ago.
Production is expected to rise less than 3 percent in 1998. Producer net returns are expected to be near record levels this summer as prices have increased and feed costs are expected to be 20 percent below a year ago.

Robust Broiler Exports Continue
Broiler exports totaled 1.6 billion pounds through the first 4 months of 1998...18 percent above the same period in 1997. Most of the growth coming from countries other than Russia, the largest market, but one that was only 2 percent higher in 1998. There was continued growth in exports to Mexico and Canada, and exports to Hong Kong have picked up strongly after being very low at the first of the year.

Turkey Production Decreasing
Turkey production is expected to decline 1 percent in 1998. After 2.5 years of negative returns for turkey producers, reductions in feed costs (27-percent below a year ago) and seasonal increases in turkey prices may allow producers to break even in July. Weak export markets and competition from large pork supplies on the domestic market are expected to keep prices under pressure with the Eastern region hen price running about 8 cents per pound below a year ago since May.

Turkey Exports Lower
Turkey exports continued to be considerably lower than the previous year, mostly due to depressed shipments to Hong Kong, the second largest market. Turkey exports are feeling the combined effects of a greatly reduced market for all poultry products in Hong Kong at the beginning of the year and strong competition from broilers, other chicken, and pork products in other markets.

Egg Production Increasing
Egg production increased nearly 3 percent in the first half of 1998 and is expected to maintain that pace for the rest of the year. 1999 egg production is expected to increase at a slower 2-percent rate. Lower feed costs are expected to offset lower wholesale egg prices, continuing the attractive net returns that started in 1995.

Egg Exports Up 1 Percent
Exports of eggs and egg products through April were up 1 percent from the previous year. Shell egg exports were up due chiefly to higher shipments to Canada and Mexico, while exports of egg products ran about even with the previous year.

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Broiler Eggs Set Up 2 Percent
The National Agricultural Statistics Service (NASS) reports commercial hatcheries in the 15-state weekly program set 176 million eggs in incubators during the week ending July 25, 1998. Up 2-percent from the corresponding week a year earlier.

Broiler Chicks Placed Down 2 Percent
Broiler growers in the 15-state weekly program placed 136 million chicks for meat production during the week ending July 25, 1998. Placements were down 2 percent from the comparable week in 1997. Cumulative placements from January 4, 1998, through July 25, 1998 were 4.06 billion, up slightly from the same period in 1997.

Egg-Type Chicks Hatched Up 6 Percent
Egg-type chicks hatched during June totaled 39.2 million, up 6 percent from June 1997. Eggs in incubators totaled 32.6 million on July 1, 1998, up 8 percent from a year ago.
Domestic placements of egg-type pullet chicks for future hatchery supply flocks by leading breeders totaled 360,000 during June 1998, up 42 percent from the 254,000 of June 1997.

Broiler Hatch Up 2 Percent
The June 1998 hatch of broiler-type chicks, at 719 million was up 2 percent from June of the previous year. There were 609 million eggs in incubators on July 1, 1998, up 3 percent from a year earlier.
Leading breeders placed 6.90 million broiler-type pullet chicks for future domestic hatchery supply flocks during June 1998, up 15 percent from June 1997.
Meetings, Seminars and Conventions

1998
August
August 4-6: U.S. Poultry Intro to HACCP Training Class, Peabody Hotel, Memphis, TN. Contact: U.S. Poultry & Egg Association, 1530 Cooleged Road, Tucker, GA. Phone (770) 493-9401.
August 24-28: 10th International Conference on Production Diseases in Farm Animals (ICPD), Veterinary Faculty, Utrecht Univ., Utrecht, the Netherlands:ICPD Conference, R.N.V.A., P.O. Box 14031, 3508 SB Utrecht, the Netherlands.
August 25: Fall Turkey Conference, Kearney Ag Center, Parlier, CA. Contact: Dr. John C. Voris, University of California Cooperative Extension Service, Kearney Ag Center, 9240 S. Riverbend Ave., Parlier, CA 93648. Phone (209) 645-6500.
August 27-28: SUEP Annual Meeting, Hyatt Riverwalk Hotel, San Antonio, TX. Contact: Southern United Egg Producers, 1534 Cooleged Road, Suite 4, P.O. Box 555, Tucker, GA 30084-7303. Phone (770) 591-1120.
August 28-30: HACCP Seminar for Small & Medium-sized Plants, Ramada Plaza Hotel, Airport East, Louisville, KY. Contact: American Association of Meat Processors, P.O. Box 269, Elizabethtown, PA 17022. Phone (717) 367-1168.
1998
September
September 9-10: Improving Your Sanitation Program Workshop, Best Western Airport Hotel, Charlotte, N.C. Contact: Dr. Elias Reynolds, University of Georgia. Phone (706) 542-2574. Or, Dr. N.G. Marrott, Virginia Polytechnic Institute & State University. Phone (540) 291-7640.
September 9-10: Texas Broiler Symposium, Frederonia Hotel & Convention Center, Nacogdoches, TX. Contact: Dr. John B. Carey, Poultry Science Dept., Texas A&M University, College Station, TX 77843-2472. Phone (409) 845-4319.
September 13-15: Western Regional Conference for AHG Health & Safety, University of California, Buuehler Alumni Center, Davis, CA. Contact: Eleanor Wood, manager, UC Agricultural Health & Safety Center. Phone (209) 885-4022.
September 15-16: Alabama Processors Workshop, Sheraton Hotel, Birmingham, AL. Contact: Alabama Poultry & Egg Association, P.O. Box 240, Montgomery, AL 36101. Phone (334) 265-2732.
September 16-17: Poultry Production and Health Seminar, Atlanta, GA. Contact: U.S. Poultry and Egg Association, 1530 Cooleged Road, Tucker, GA 30084-7303. Phone (770) 493-9401. Fax (770) 493-9257.
September 23: Delmarva Breeder, Hatchery and Grow-out Conference, Wicomico Youth & Civic Center, Salisbury, MD. Contact: University of Delaware Cooperative Extension, R.D. 6, Box 48, Georgetown, DE 19947. Phone (302) 856-7303.
September 25-27: Louisiana Poultry Federation Convention, Sheraton Pferemont, Shreveport, LA. Contact: Dr. Rosilyn Williams, Louisiana State University, Knapp Hall, Baton Rouge, LA 70803.
September 30-Oct. 1: Practical HACCP for Food Processors, Adam's Mark Denver Hotel, Denver, CO. Contact: Stilliker Laboratories, Education Services Dept., 900 Maple Rd., Homewood, IL 60430.
1998
October
October 5-9: Laboratory Methods in Food Microbiology, Stilliker Laboratories Corporate Research Center, Teaching Laboratory, South Holland, IL. Contact: Stilliker Laboratories, Education Services Dept., 900 Maple Rd., Homewood, IL 60430.
1998
November
November 5-6: AEB Meeting, San Diego, CA. Contact: American Egg Board, 1460 Renaissance Drive, Park Ridge, IL 60068. Phone (847) 295-7043.
November 10-13: EuroTier '98, Hannover Torusm Center, Hannover, Germany. Contact: Deutsche Landwirtschafts-Gesellschaft, Eschborner Landstrasse 122, D-60489 Frankfurt am Main, Germany.
1998
January
January 18-19: Southern Poultry Science Society Annual Meeting, World Congress Center, Atlanta, GA. Contact: Dr. Dena Petka, Dept. of Poultry Science, Livestock & Poultry Building, University of Georgia, Athens, GA 30602. Phone (706) 542-1371.
January 20-22: The International Poultry Exhibition, Georgia World Congress Center, Atlanta, GA. Contact: Southeastern Poultry & Egg Association, 1530 Cooleged Road, Tucker, GA 30083. Fax (770) 493-9257.