Current Topics

SCIENCE POLICY
FDA Seeking To Curb Ag Use of Antibiotics, Review Antibacterial Soaps

Jeffrey L. Fox

Officials of the Food and Drug Administration (FDA) last December announced a plan for phasing out the use of antibiotics for promoting growth in animals such as chickens, hogs, and cattle for food production. In a separate move in December, the agency directed manufacturers of antibacterial hand soaps and body washes to demonstrate that their products are safe for long-term use and more effective than ordinary soaps in preventing infections.

The plan to phase out low-dose, farm use of antibiotics is voluntary, not regulatory, and it puts considerable responsibility on veterinarians to ensure that such drugs are used appropriately. It calls on manufacturers to change such drugs from having over-the-counter (OTC) status to making them prescription only. Agency officials say that the two major suppliers of antibiotics for use in feeds, Elanco of Greenfield, Ind., and Zoetis of Florham Park, N.J., are promising to comply with the new policy.

Largely because these changes are to be voluntary and without agency enforcement measures, however, the broader response to this FDA initiative varies widely, ranging from enthusiasm to deep skepticism. Further, critics of the agency plan are concerned that it will not take full effect for three or more years and that its allowance of antibiotic use for “preventive” purposes might be a loophole for their future use for growth promotion under this different rubric.

“Our fear is that there will be no reduction in antibiotic use as companies either ignore the plan altogether or simply switch from using antibiotics for routine growth promotion to using the same antibiotics for routine disease prevention,” says Steven Roach, Senior Analyst for Keep Antibiotics Working, a coalition of consumer and advocacy groups in Washington, D.C. On this matter, FDA is counting on veterinarians to “play an important role to ensure the products are used judiciously and appropriately,” says William Flynn, deputy director for the FDA Center for Veterinary Medicine.

Members of the American Veterinary Medical Association (AVMA) in Schaumburg, Ill., appear eager to accept that mandate. “AVMA has long advocated that greater veterinary oversight of the use of antimicrobials on the farm is a benefit to human and animal health,” says its president Clark Fobian. The organization “applauds” the new agency plan and, among other things, praises it for allowing “greater flexibility by deferring to the profession and individual states for specific criteria on professional conduct related to veterinary supervision or oversight.”

However, animal feed producers consider the timeline too fast in part because there are not enough veterinarians to handle these new duties. “There are some 15 or so chemical entities that are approved as animal drugs and over 120 different uses that will be affected by changes FDA is proposing,” says Richard Sellers, a vice president of the American Feed Industry Association in Arlington, Va. “AFIA continues to be concerned about the lack of vet-
RESEARCH ADVANCES

Mounting Evidence: Endogenous Retroviruses Are Part of Us

Marcia Stone

“A broad swath of viruses” invades eukaryotic genomes, and these mobile genetic elements are genomic “mercenaries,” says Harmit Malik of the Fred Hutchinson Cancer Research Center in Seattle, Wash., who spoke at Rockefeller University in New York City last December. Among them are the retroviruses, many of which integrate into animal host genomes and are vertically inherited. More than 100,000 of these retroviral fossils so far found in the human genome are also in simian primates that shared a common ancestor more than 30 million years ago.

“Retroviruses are typically not particularly choosy about their integration sites, as evidenced by the enormous scale of their invasions into animals, birds, and even large DNA viruses—retroviral sequences accounting for 6–14% of all the genomes so far analyzed, including approximately 8% of human DNA,” says Robin Weiss at University College, London. “To put this into perspective, endogenous retroviruses (ERVs), whole or in part, generally comprise more of our genomic DNA than that encoding the proteome.” Details appear August 12, 2013 in Philosophical Transactions of the Royal Society Biological Sciences (368: 20120494.http://dx.doi.org/10.1098/rstb.2012.0494).

“The consequences of such ERV relationships can be neutral, detrimental, or beneficial,” says Jonathan Stoye from the MRC National Institute of Medical Research in London. “In the coevolutionary interplay between host and virus, the host develops various strategies to dampen down ERV activation but that same retrovirus can wreak havoc in immunologically unprepared new hosts.” For example, the leukemia-causing retrovirus of gibbons and koalas is derived from an ERV that colonizes rodents without making them ill, he says, adding: “The koala virus is currently colonizing the koala germ line as a new ERV.”

“The devastating spread of human immunodeficiency virus (HIV) in humans after an exogenous simian immunodeficiency virus (SIV) jumped species from chimpanzees is another consequence of cross-species transmission,” Stoye says. “However, there is no evidence of germ-line colonization by SIVs and the only cases where we suspect that lentiviruses have gone endogenous are in rabbits and lemurs; with both events occurring more than 10 million years ago. It’s an interesting question why this is—perhaps most lentiviruses just will be lethal or they simply don’t have the right receptors to get into germ cells.”

Unlike those of any known exogenous retroviruses, some ERV genes have been co-opted by their hosts and

MINITOPIC

Influenza Update

Recent developments involving the influenza virus include:

• Officials of the Food and Drug Administration in November approved the first adjuvanted vaccine to protect against influenza H5N1 for inclusion in the National Stockpile for emergency use. The vaccine is produced by ID Biomedical Corporation of Quebec, Quebec City, Canada, a subsidiary of GlaxoSmithKline Biologicals.

• A mutation (G228S) in its gene for hemagglutinin enabled an avian-origin H6N1 influenza virus for the first time to infect a human, a 20-year-old woman who fully recovered and did not transmit the virus to her close associates, according to Feng-Yee Chang from the Centers for Disease Control in Taipei, Taiwan, and his collaborators. Details appear December 2013 in Lancet (doi: 10.1016/S2213–2600(13)70221–2).

• Mice treated with the antifungal drug amphotericin B become more susceptible to influenza, suggesting that humans may be similarly vulnerable, according to Abraham Brass of the University of Massachusetts Medical School in Worcester and his collaborators. Details appear November 27, 2013 in Cell Reports (doi: 10.1016/j.celrep.2013.10.033).

• During the 2012–2013 season, there were a total of 31.8 million influenza-associated illnesses, 14.4 million medically attended illnesses, and 381,000 hospitalizations in the United States. However, vaccination prevented an estimated 6.6 million influenza-associated illnesses, 3.2 million medically attended illnesses, and 79,000 hospitalizations, according to a December 2013 report from the Centers for Disease Control and Prevention in Atlanta, Ga.