Introductory remarks

Good morning and thank you Senator Florez for the opportunity to address this committee on the important topic of antibiotic use in food animals. I am Scott Hurd, currently associate professor in the college of veterinary medicine, Iowa State University. I have a veterinary degree, practice if food animal production and then completed a PhD in epidemiology and economics. I have been active in food safety research for over twenty years beginning with publication of the first US risk assessment for Mad Cow. Most recently I completed a term of service as the USDA Deputy Undersecretary for Food Safety. In that capacity, I was responsible for the public health of consumers through the inspection all meat, poultry and egg products produced or imported under federal inspection. This is FSIS mission.

As a scientist and previously as a political appointee, I deeply appreciate how important it is that policy decisions be made on sound science. As the president said, just last week, "we must make scientific decisions based on facts, not ideology." Why? These bacteria are nonpartisan. Salmonella and Streptococcus don't vote and don't watch TV. The basics of microbiology, animal disease prevention, food production, and risk assessment apply equally to us all. If they policies are not built on science, they won't work; they won't make the world a safer place.

I am confident that the members of this committee share that commitment to sound scientific decision making. I see that this committee understands the challenge of protection our finite resources while feeding a growing population, and I assume while protecting the public health. Therefore, I assume you want your policies to work!

My hope today, is to inform the committee of some important scientific research, that I believe you will take into your deliberations.

Summary of my points

1. Must be case by case analysis of risk

Every drug has specific modes of action. Every bacteria has different methods to resist those actions. Therefore, evaluation of human health risk and the value or removing a product from California farmers, must be made on a case by case or bug-drug-use basis; blanket bans are awkward.

2. Case by case risk is low

The published scientific risk assessments done to date on specific bug-drug-use combinations have demonstrated an extremely low to nonexistent risk. Therefore, the public health and political benefit of antibiotic bans will be low, nonexistent, or even contrary to public health.

3. Secondary consequence

There are significant secondary public health consequences from the consumption of unhealthy animals which are likely to result from antibiotic bans.

If you want to make food production for Calf farmers more difficult then take away antibiotics

If you want to decrease the health of meat animals entering the food chain, then take away antibiotics

If you want to make a decision not based on sound science and not supported by FDA guided risk assessments, then take away antibiotics

Of course this committee is now expecting that I support such bold statements, especially since they run counter to much of today's popular thinking. But before, I do may I address a few misconceptions, which I am sure this committee does not have, but may communicated during the course of this debate.

Misconceptions

Not all food safety problems are related to Abx

First we should clarify none of the recent food safety problems are remotely related to antibiotic use. Salmonella got into our peanut butter from the environment. Ground beef from Hallmark meats in Chino was recalled because downer cows were entering the food chain. The E coli 0157:H7 that contaminated California spinach was not resistant to antibiotics.

Not talking occupational exposure

MRSA

The real risk is very very low?

For those few case by case risk assessments scientifically conducted the risk has been show to be very low, teeny weeny. For one project, I led, looking at multiple uses of macrolide antibiotics (related to erythromycin), we showed that you were more likely to DIE from a bee sting than get a few extra days of diarrhea. The overall risk was less than on in 10 million. The results are shown in Table 1 of your handout and the scientific publication is in my submitted materials

In your handouts, figure 1, is a flow chart showing all the necessary steps which absolutely must occur for there to be actual human health harm. Note that if any one of these events does not occur there is NO RISK. Failure to consider this causal pathway and the fact that all events must occur, will lead some to overestimate the real risk on on-farm antibiotic use.

Another paper by Cox et al showed…..

Why do these findings disagree with opinions of many other public health experts?

Good question, I think there are three reasons which are all areas for positive scientific discourse.

Long way farm to fork

First, when talking about pathogens, there are many interventions aimed at keeping pathogens and farm contamination off the dinner plate. The Food Safety Inspection Service, of which I was the head veterinarian, has a zero tolerance for all forms of fecal contamination. Additionally, E. coli 0157:H7 and Listeria are legally classified as adulterants, meaning none is allowed and all positive product must be recalled.

Causal pathway must exist

Public health experts may look at the presence and even increasing prevalence of resistant organism on the farm, then make a big leap to the dinner plate or to the sick patient. As Figure 1, mentioned a moment ago shows, there are many steps which MUST occur for risk to actually be felt. Just like lining up dominoes on the table, the existence of a gap anywhere along the pathway will prevent the final dominoes from falling. Sorry for the childish analogy, it is clear I have lots of children.

Case by case has not been done

Lastly, I am convinced there is much disagreement because case-by-case, or bug-drug risk assessment has NOT been implemented. The question must be asked specifically, for example what is the risk of Campylobacter spp resistant infections due to macrolide use on swine farms? The US Food and Drug Administration, Guidance 152 has adopted this case-by-case approach to evaluating an antibiotic's safety. Additionally, the Codex Alimentarius, who sets world-wide standards for food regulations, is currently developing guidelines which are also built on case-by-case evaluation of risk. I am a member of this Codex committee and I can assure you, while it is true that some countries like Denmark have banned large groups of antibiotics, this is not likely to become a world-wide trend.

Secondary consequences

Up to this point, I have argued that the risk is very, very low, but might well reply, but we don't want any additional risk. I agree there seem to so many things out there that may harm us. Why would we take on any additional risk, if we don't have to, ie if there is no benefit. Therefore, we must now turn to the question of what good or bad can the ban of antibiotics accomplish.

Denmark showed significant impacts with questionable gain

As you may know Denmark, in 1999?? Prohibited the use of all growth promoting and preventative antibiotics in pork production. This experiment is often touted as positive public health policy. I will not give you my opinion or analysis, but I will show you data from the Danish Ministry of Agriculture and make some quotations for the World Health Organization who reviewed this policy in 2002. The executive summary from that report is in the materials I provided.

First you will not in Figure 2, that the total tonnage of antibiotic used in Denmark did decrease. However, please note that the amount of product used to TREAT SICK pigs increased, 100%. It doubled. Why? Because the prior useage which, was labeled "growth promotion" was actually preventing illness. It was doing good, therefore, it cannot be termed "non-therapeutic".

Now what is key here is the type of drugs used to TREAT pigs was different that what had been preventing disease. These treatement drugs are very similar to those used to treat human illness. Now lets see what the World Health Organization, had to say about these events and data.

> It is probable, however, that termination of antimicrobial growth promoters had an indirect effect on resistance to tetracycline resistance among *Salmonella* Typhimurium because of an increase in therapeutic tetracycline use in food animals.

> Increased tetracycline resistance among *Salmonella* may result in additional human *Salmonella* infections, however, since persons who take tetracycline for other reasons are at increased risk of becoming infected with tetracycline-resistant *Salmonella*.

So, they are saying, there might be MORE risk now than before the ban because of increase in treatments.

Secondly, they said resistance in human food borne pathogens such as *Salmonella* and *Campylobacter* have not decreased at all

Lastly, they describe significant health and economic impacts on pork production. US economists have shown, if those same impacts occurred in California it would add $4.50 or about to the price of every pig. I spent three months working in Denmark, I can assure you these impacts are real and still present. So I am sure this committee will balance this information with your goal of "protecting finite resources while feeding a growing population."

Risk of reduced animal health

Another overlooked but increasingly important secondary consequence of an antibiotic ban is the consumption marginally healthy animals may increase human health risk. I have conducted preliminary studies demonstrating a quantifiable and important association between indicators of subclinical livestock health and foodborne risk. One study, using limited poultry data, showed that for every 1% increase in poultry airsacculitis at slaughter, there is a 4% increase in human campylobacteriosis illness rates. Two other studies, using primary data collected by this team, showed that pig carcasses affected with lesions indicating chronic internal infections were 2 to 5 times more likely to be contaminated, at end of slaughter, with *Salmonella spp.* and *Campylobacter spp*. The results of that paper are shown in your handout. Note, this paper was not published in some pro industry magazine, but in one of leading scientific public health journals.

Concluding summary of my points

So in summary, I think you can see that feel passionately about protecting public health and protecting California's producers. There is rarely any easy, one-size-fits all answer to complex microbiological, animal and food production questions.

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Evaluation of human health risk and the value or removing a product from California farmers, must be made on a case by case or bug-drug-use basis.

Case by case risk is low

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Secondary consequence

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Reference materials

SMRA paper

PHR paper

Cox paper