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Office of Science and Technology Policy
Executive Office of the President
725 17th Street Room 5228
Washington, DC 20502
bioeconomy@ostp.gov

RE: Request for Information: Building A 21st Century Bioeconomy

To Whom It May Concern:

I am writing on behalf of the Federation of Animal Science Societies (FASS) in response to the notice placed in the Federal Register on October 11, 2011 requesting information on “Building A 21st Century Bioeconomy”. FASS represents over 10,000 scientists and has great interest in advancing biological research innovations to meet the national challenges identified in the request for information, including health, food, energy, and the environment. We appreciate the opportunity to comment and wish to highlight a number of high priority policy issues related to the animal sciences.

Attached to this letter is a series of Science Policy Statements that FASS has developed over the last two years. The topics covered by these policy statements include many of the issues raised in the Request for Information, including nutrition and health, food security, and environmental stewardship. We believe that these policy statements can be helpful to the Office of Science and Technology Policy as its leaders continue to develop the National Bioeconomy Blueprint. Additional information regarding these issues, including recent FASS-sponsored webinars, can be found at the FASS website: www.fass.org.

Please let us know if you have any questions regarding the attached policy statements or if FASS can be of further assistance. Lowell Randel serves as the FASS Science Policy Director, and he can be reached at [REDACTED] FASS and its network of scientists stand ready to help in building our nation’s bioeconomy.

Sincerely,

A handwritten signature in black ink, which appears to read "James W. Oltjen". The signature is written in a cursive, flowing style.

James W. Oltjen, Ph.D.
President, Federation of Animal Science Societies



BIOTECHNOLOGY AS A TOOL TO ENHANCE SUSTAINABILITY FOR ANIMAL PRODUCTION

Rationale:

The United Nations Convention on Biological Diversity describes Biotechnology as “Any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use” (1). This definition extends to many aspects of animal agriculture used over the last century including animal breeding, artificial insemination, and the use of vaccines. More recently, biotechnologies are used for gene transfer to modify gene expression (transgenics), in health care (insulin for diabetics), or for environmental clean up (bacteria that can digest oil). In addition, comparing genomics of organisms that are resistant and susceptible to disease to identify genetic markers is used to select for genotypes that favor desired health status or production traits.

The world population will increase from 6.7 billion to 9.2 billion by 2050 (2,3). By 2020, the global demand for meat will increase by 58%; milk consumption will increase from 568 to 700 million tons; egg production will increase by 30%; and demand for poultry, beef and pig meats will increase by 85%, 80%, and 45%, respectively, from 1995 levels (2). With only 2% more arable land available for food production in North America in 2050, there must be continual improvement in productivity per unit of land area (3). FAO estimates that 70% of these gains in production must come from the use of new technologies (4). Modern biotechnology offers solutions to challenges for environmentally sustainable animal production that are not achievable using historical technologies. However, the use of biotechnology in food animal production can be a contentious issue for some consumers.

Policy Statement:

FASS recommends that the basis for acceptance of the use of biotechnology to improve the sustainability of agricultural production be from a science-based viewpoint. FASS believes that adoption of modern biotechnology is critical to meet the growing demands for sustainable food production in the next 25-50 years. FASS believes that consumers should have the right to choose what technology they embrace by having the freedom in the marketplace to buy products with the attributes they desire.

Policy Objectives:

- FASS endorses the importance of continuing to do research and where applicable adopt modern biotechnologies to safely improve the attributes of agricultural production systems, and the plants and animal products used and consumed by the world's human population.
- FASS endorses that rational, scientifically-based systems be adopted in governmental policy regarding the research and introduction of agricultural biotechnologies, including the production, marketing, and global trade of plant and animal products derived from the use of biotechnology.
- FASS can provide information and educational assistance to any agency or educator as a resource to support the science underpinning the use of a biotechnology related to animal agriculture.
- FASS encourages funding for research and education necessary to provide the fundamental biological knowledge of organisms, including genomes, that will lead to strategies for global solutions that address the grand challenges for production of abundant, safe and affordable foods for the 21st century and beyond.

References:

1. "The Convention on Biological Diversity (Article 2. Use of Terms)." United Nations. 1992. Retrieved on February 6, 2008.
2. http://www.grid.unep.ch/geo1/ch/ch4_9.htm Accessed 07DEC2010.
3. USDA Agricultural Projections to 2017. Office of the Chief Economist, World Agricultural Outlook Board, U.S. Department of Agriculture. Prepared by the Interagency Agricultural Projections Committee. Long-term Projections Report OCE-2008-1, 104 pp.
4. Food and Agriculture Organization of the United Nations (FAO). 2004. Protein Sources for the Animal Feed Industry. Expert consultation and workshop. Bangkok 29April-3May 2002. FAO, Rome.

Adopted by the FASS Board of Directors on May 5, 2011

For more information, please contact FASSPolicyStatements@assoqhq.org



CO-PROMOTION OF ENVIRONMENTAL STEWARDSHIP AND PRODUCTION EFFICIENCY

Rationale:

Preservation of the ability of future generations to meet their needs while adequately serving the present population (sustainability) requires control of greenhouse gas (GHG) production and avoiding damage to air, water and soil. Simultaneously, growing populations and rising purchasing power in developing countries will strain the earth's finite capacity to produce enough high-quality protein and nutritionally rich foods, demanding efficient production of food. Fortunately, a growing body of evidence related to production of foods of animal origin suggests that production efficiency leads to environmental stewardship.

The current situation is:

- The United Nations (UN) estimates the current world population to be about 6.9 billion and projects it to rise to more than 9 billion in 2050. (1)
- Population growth rates in developing countries remain nearly twice those of developed countries. These rapidly increasing populations are accompanied by increased income and increased demand for meat and other animal products (50% increase by 2020). (2)
- Food security is and will continue to be a major challenge, (3, 4) A recent report by the UN's Food and Agriculture Organization (FAO) estimates that global food production must increase 70% by 2050. (5) Even within the US, USDA estimated that in 2008 14.6% of households were food insecure during at least some portion of the year. (6)
- Properly managed modern animal production systems and technologies have clear environmental advantages over older, less efficient production models. To produce the same amount of milk, modern dairy production practices require 79% fewer animals, 77% less feed, 65% less water, and 90% less land than systems used in 1944. Modern dairy systems produce 76% less manure and 63% less carbon than those of the 1940s. (3)
- Contrary to some previous reports, a recent study found that the contribution of direct livestock emissions (from enteric fermentation and manure) amounts to less than 3% of total GHG emissions caused by man. (7)
- The FAO concluded that intensification of livestock production offers significant opportunities to mitigate climate change, largely by increasing efficiency of feed use and thereby reducing the need to expand feed production onto environmentally critical land. (8)

Policy Statement:

FASS supports minimization of greenhouse gas production and proper management of manure nutrients to avoid environmental damage from the necessary production of food of animal origin.

Policy Objectives:

- FASS opposes restriction on animal production technology when these restrictions may reduce efficiency and therefore increase environmental degradation.
- FASS supports increased funding for research, extension and education directed to improving environmental quality by increasing the efficiency of feed use by animals.

References:

1. World Population Prospects: The 2008 Revision Population Database. United Nations Population Division. <http://esa.un.org/unpp/>
2. USDA Agricultural Projections to 2017. February 2008. USDA Economic Research Service.
3. Capper et al. The environmental impact of dairy production: 1944 compared with 2007. *Journal of Animal Science* 2009. 87:2160-2167.
4. <http://www.beeftechnologies.com/enviroImpact/impact-resources-land.html>
5. How to feed the world in 2050. A report from the World Summit on Food Security held in Rome, November 16-18, 2009
6. Household Food Security in the United States, 2008. November 2008. USDA Economic Research Service.
7. Pitesky et al Clearing the Air: Livestock's Contribution to Climate Change. In: *Advances in Agronomy*, Vol. 103.
8. *Livestock's Long Shadow – Environmental Issues and Options.* Food and Agriculture Organization of the United Nations. Rome, 2006.

Adopted by the FASS Board of Directors on March 29, 2010

For more information, please contact FASSPolicyStatements@assoqh.org



FARM ANIMAL WELL-BEING

Rationale:

Scientists and animal producers have an ethical obligation to provide environments for farm animals that promote animal well-being. Determination of the animal's well-being is only gained through understanding the science of farm animal needs. The production of safe and high-quality animal-based food and fiber in a sustainable manner is essential for consumers as well as livestock and poultry producers. It is in the interest of animal industries and research and teaching organizations to use science-based standards to provide the best possible animal care.

- Animal scientists have conducted scientific investigations that establish and refine management practices that provide for optimal care, handling, housing, nutrition, and husbandry practices for farm animals.
- FASS has published a compilation of the scientific literature directed at sound farm animal care at universities, government laboratories, and research companies in its Guide for the Care and Use of Agricultural Animals in Teaching and Research, the Ag Guide. The Ag Guide provides up-to-date information on science-based farm animal care in agricultural and biomedical teaching and research¹. Although other guides are available, the Ag Guide is the most comprehensive, current, science-based document authored by dozens of professional animal scientists and peer reviewed by individuals and organizations.
- FASS encourages those involved in commercial animal agriculture and oversight of teaching and research programs to use science-based criteria to develop and refine guidelines for farm animal care.
- Companies in the food marketing chain are encouraged to support science-based animal care standards as they implement animal care programs.
- Animal scientists are investigating current and new production systems to promote sound farm animal care. Changes in farm animal care practices need to be considered in the context of impacts on the environment, food safety, and societal views. Understanding and considering societal concerns will lead to more sustainable production systems.

Continued improvement in husbandry practices enhances the well-being of animals and is a necessary part of satisfying the increasing world demand for animal-based food and fiber. The public has a legitimate interest in the potential environmental, food safety, and animal welfare implications of livestock and poultry production. The animal science community must faithfully, and in an unbiased manner, examine those implications in a scientifically rigorous fashion—investigating, teaching, and implementing those practices and technologies found to maximize production efficiency while providing for the well-being of the animal.

Policy Statement:

The Federation of Animal Science Societies (FASS) encourages the use of management practices and technologies that have been developed through scientific investigations and have been shown to promote animal well-being.

Policy Objectives:

- Support the use of science-based practices such as described in the Guide for the Care and Use of Agricultural Animals in Research and Teaching (1) and/or other science based appropriate standards that promote animal-well being in farm animals in all settings.
- Support the use of science-based practices that promote animal-well being in laboratory animals in research settings.
- Support the use of harmonized guidelines for farm animal care at universities, government laboratories, and industry research facilities.

References:

1. FASS. 2010. **Guide for the Care and Use of Agricultural Animals in Teaching and Research**. 3rd ed. Federation of Animal Science Societies, Champaign, IL. Available online: <http://www.fass.org/page.asp?pageID=216>.

Adopted by the FASS Board of Directors on August 12, 2010

For more information, please contact FASSPolicyStatements@assoqh.org



ENSURING FOOD SECURITY THROUGH RESEARCH, EXTENSION AND EDUCATION

Rationale:

The high food prices and food shortages that occurred in several countries during 2008 provide a sharp reminder of the fragility of the food security of the United States and the world. Our food production system has been remarkably successful in meeting food needs in the past, but the challenge continues. Food demand continues to grow rapidly, making it imperative that we substantially increase public funding for improvements in food production.

The current situation is:

- The world's human population continues to grow, and large numbers of people in developing countries are emerging from deep poverty and demanding improved diets; these factors will challenge the world's food production capacity during coming decades.
- To feed the people of the world sustainably, food producers must continue to increase the efficiency with which they use the earth's limited resources. That includes continued increases in efficiency of livestock production.
- Food reserves have dwindled during recent years; for example, the soybeans remaining at the end of the 2008-2009 crop year are projected to be only about 2 weeks' supply (1).
- Large amounts of crops are now being diverted from the food chain to produce biofuels.
- Due to the historically productive research, extension and education infrastructure, the U.S. enjoys the safest and most abundant supply of food in the world, contributing to public health.
- Legitimate societal interest in animal well-being, food safety, food composition and environmental quality expands the scope of research needed.
- State funding for agricultural research has dropped substantially during recent decades, and research funding from USDA has not made up the loss (2); the costs of research addressing issues of societal concern compete for already strained budgets for research on production efficiency, which is critical to sustainable production. At the same time, much research funding has been diverted from food production to biofuels production.
- Funding for research in livestock production is now especially important because of the increased consumption of animal products by people in developing countries, but such funding continues to lag behind the needs.

Policy Statement:

The Federation of Animal Science Societies (FASS) supports increased funding for research, extension and education related to food production in order to strengthen the food security of the United States and the world.

Policy Objectives:

- FASS supports increased funding within the USDA National Institute of Food and Agriculture for the basic and applied research on food production necessary to sustainably meet the food needs of the world's population.
- FASS supports increased funding for research on production of foods of animal origin, including research on production efficiency, animal well-being, food safety, food composition and environmental quality.

References:

1. World Agricultural Supply and Demand Estimates. ISSN: 1554- 9089. U.S. Dept. of Agriculture, Econ. Res. Serv. June 10, 2009.
2. Schimmelpfennig, David, and Paul Heisey. U.S. Public Agricultural Research: Changes in Funding Sources and Shifts in Emphasis, 1980- 2005. EIB- 45, U.S. Dept. of Agriculture, Econ. Res. Serv. March 2009.

Adopted by the FASS Board of Directors on October 23, 2009

For more information, please contact FASSPolicyStatements@assoqhq.org



INTERNATIONAL AGRICULTURAL DEVELOPMENT AND THE ROLE OF ANIMALS

Rationale:

About a billion people in the world are food-insecure (1), unable to obtain enough food every day, creating a serious humanitarian and national security problem. The solution for this enormous and complex problem must include increased food production both globally and in the countries with greatest food insecurity.

Important aspects of the issue include:

- Global food security is impossible without global food sufficiency.
- With increasing populations and purchasing power in developing countries, demand for animal products will increase dramatically during coming decades.
- Crop yields and animal efficiency are substantially lower in developing countries than in developed ones, providing opportunity for rapid improvement.
- Past success shows that necessary increases in food production require significant public investments in research, extension and education.
- Public research and educational funding directed to food production has diminished during recent decades (2).
- Agricultural development involves not only farming technology, but also infrastructure such as roads, supply and marketing chains, banking, legal systems and others.
- Livestock benefit smallholders in resource-poor regions by utilizing non-food biomass, as a source of essential nutrients and as a cash reserve

Policy Statement:

The Federation of Animal Science Societies (FASS) strongly supports all efforts to enhance international agricultural development to promote global food security, and emphasizes that animal production must be an integral component of developing agricultural systems.

Policy Objectives:

- Promote awareness of the food situation in developing countries among the U.S. population to build support for international agricultural development.
- Provide targeted development programs and locally-relevant research, extension and education to support food systems, including livestock production.
- Address the impacts of climate change on agriculture, including livestock production, and the environmental sustainability of food production systems.
- Increase the supply of animal products to improve the nutritional status and health of people in the developing world.

References:

1. FAO, 2009. <http://ftp.fao.org/docrep/fao/012/i0876e/i0876e.pdf>. Accessed February 22, 2011.
2. Eicher, 2009. Rev. B us. Econ. LIV.3:238-257.

Adopted by the FASS Board of Directors on May 5, 2011

For more information, please contact FASSPolicyStatements@assoqhq.org



NUTRITION AND HEALTH PROVIDED BY ANIMAL PRODUCTS

Rationale:

A diversity of food sources remains a key element to a balanced diet, good health and even survival (1). Animal products are excellent sources of high quality protein and other nutrients that are readily absorbable, and thus make important contributions to a nutritionally balanced diet.

As societies develop economically, they tend to add diversity to their diets. Typically, animal products are more expensive than vegetable products but animal products are well recognized for bringing a more balanced nutritional status to a population. Diets that exclude animal products often require dietary supplements (2,3). Furthermore, meat, eggs and dairy foods provide complementary nutrition to most indigenous diets, resulting in improved nutritional status and health of global populations.

Policy Statement:

FASS works to raise the nutritional status of the global population by expanding the diversity of foods available to all, especially through the inclusion of nutritionally dense animal products.

Policy Objectives:

- FASS supports having available to all people all the foods necessary for a balanced diet and optimal nutritional status. Nutrient density represents a major factor that is efficiently delivered through dairy, meat and egg products.
- FASS can provide nutritional data and educational assistance to any agency or educator showing how to optimize local diets in order to achieve higher nutritional status in a given population.
- FASS remains committed to developing new technology that will enhance sustainability while decreasing the cost of production of animal products and thus the cost to consumers.
- FASS encourages funding for research and education to meet these three objectives that focus on improving the nutritional status of all people.

References:

1. Arimond, M. and M.T. Ruel. 2004. Dietary diversity is associated with child nutritional status: Evidence from 11 demographic and health surveys. *J. Nutr.* 134:2579-2585.
2. Shils, M.E., M. Shike, A.C. Ross, B. Caballero, and R.J. Cousins. 2005. *Modern nutrition in health and Disease.* Lippincott, Williams, and Wilkins.
3. Elmadfa, I. and I. Singer. 2009. **Vitamin B-12 and homocysteine status among vegetarians: a global perspective.** *Am.J. Clin. Nutr.* 89(suppl):1693S-1698S

Adopted by the FASS Board of Directors on August 12, 2010

For more information, please contact FASSPolicyStatements@assoqh.org



PRESERVING THE BENEFITS OF ANTIBIOTICS FOR PEOPLE AND ANIMALS

Rationale:

Antibiotic resistance in pathogens occurs too often and with increasing frequency, interfering with treatment of sick people and animals. Although antibiotics and antibiotic resistance are natural phenomena, the population of resistant bacteria is increased by introduction of antibiotics into an environment. Therefore, it is important to examine carefully the wisdom of all uses of antibiotics, in both humans and animals.

Key considerations regarding the use of antibiotics in food animals include:

- Antibiotics are used in the care of food animals for disease treatment, disease prevention and increased production from limited feed resources.
- Feeding antibiotics to young animals is particularly effective in decreasing mortality and morbidity and thereby increasing animal welfare.
- In practice (1), targeted restrictions on antibiotic use have resulted in less total antibiotic use than a total blanket ban on continuous feeding of antibiotics.
- Antibiotic use in animals can lead to resistant pathogens in humans, but the extent to which antibiotic use in livestock production contributes to the overall problem is not fully understood.
- Exhaustive reviews (2,3) have not shown clear evidence of a significant contribution.
- Some classes of antibiotics used in food animals are not currently used in human medicine, so elimination of their use would not be expected to affect antibiotic resistance in humans.
- Antibiotic use in food animals is strategically targeted, following judicious use guidelines based on reliable evidence developed by the American Veterinary Medical Association (4) and other organizations.
- To decrease antibiotic use, food animal producers have implemented an impressive array of approaches to keep animals healthy and reduce the need for antibiotics, including all-in/all-out animal flow, rigorous biosecurity measures to keep diseases out of farms, intense sanitation, and vaccines.
- The world must double food production in the next 4 decades with limitations and additional inputs and judicious use of antibiotics can contribute to efficient food production to meet this demand.

Policy Statement:

The Federation of Animal Science Societies (FASS) strongly supports the judicious use of antibiotics in food animal care consistent with the health and welfare of the animals, with preserving the value of antibiotics in protecting human and animal health, and with efficient use of the earth's resources in food production.

Policy Objectives:

- Develop strategically targeted regulations for antibiotic use in food animals that are focused on specific risks, specific classes of antibiotics and specific uses to most effectively protect human and animal health.
- Continue the use of antibiotic in food animal populations where it is demonstrably efficacious in treating disease, promoting health, and increasing global food security.
- Develop regulatory systems that support use of antibiotics for disease prevention where justified.

References:

1. Ministry of Food, Agriculture and Fisheries. 1996-2008. DANMAP 2008: Danish Integrated Antimicrobial Resistance Monitoring and Research Program. <http://www.danmap.org/>. Retrieved January 18, 2010.
2. National Research Council 1999. The Use of Drugs in Food Animals: Benefits and Risks. National Academy Press.
3. Institute for Food Technologists. 2006. Antimicrobial Resistance: Implications for the Food System. <http://www.ift.org/Knowledge%20Center/Read%20IFT%20Publications/Science%20Reports/Expert%20Reports/Antimicrobial%20Resistance.aspx?page=viewall>. Retrieved June 10, 2010.
4. American Veterinary Medical Association. 2009. Judicious Use of Antimicrobials. <http://www.avma.org/products/scientific/jtua.pdf>. Retrieved June 10, 2010.

Adopted by the FASS Board of Directors on August 12, 2010

For more information, please contact FASSPolicyStatements@assoqh.org



PRESERVING WATER QUALITY ASSOCIATED WITH LIVESTOCK AND POULTRY PRODUCTION

Rationale:

Livestock and poultry production has evolved to fewer and larger production units for several reasons, including the benefits of scale in efficient use of resources. As livestock and poultry production units have increased in size, there have been concerns about their impact on natural resources including water quality.

- Animal production systems have adopted many technologies designed to protect water quality, guided by a complex set of federal and state regulations. A few examples of those technologies include:
 - Containment of process-generated waste water and storm water runoff
 - Rigorous construction standards for manure storage containers made of earth, concrete or other materials
 - Application of manure to cropland at rates corresponding to the uptake of nutrients by the crops
 - Incorporation of manure into soil when applied to cropland
- Application of these technologies requires a high level of expertise and management.
- Animal producers, their families, their employees and their animals have the same needs for high-quality water as other people.
- Recycling of nutrients in animal manure to cropland is the oldest recycling program, and throughout history has contributed to food security.
- The world must double food production in the next 4 decades with little new land available for cultivation, less water available for irrigation, and perhaps limited supplies of fertilizers. Thus we must maximize food production from the earth's limited resources.

Policy Statement:

FASS supports preservation of water quality along with efficient use of resources in animal production.

Policy Objectives:

- FASS supports scientifically based protection of both ground water and surface water.
- FASS supports policy that acknowledges the value of efficient animal production in promoting food security.
- FASS supports focus on protection of the environment and on efficient use of resources.
- FASS encourages funding for research and education to meet objectives that focus on improving nutrient management and water quality.

Adopted by the FASS Board of Directors on May 5, 2011

For more information, please contact FASSPolicyStatements@assoqhq.org