**Growth Enhancers (Beta-Adrenergic Agonists) and Cattle-Feed**

Beta-2 agonists are widely utilized by cattle raisers in the US since the Food and Drug Administration (FDA) approved their utilization in cattle feed in 2003. Beta-2 agonists are estimated to be used in 60-80% of cattle raised in the US. Beta-2 agonists are not only licensed for cattle feed in the US, but also in Canada, Australia, Japan and Mexico. However, the usage of beta-2 agonists in cattle feed is prohibited in Guadeloupe, Iceland, Martinique, Monaco, Norway, Switzerland and all European Union countries. This article aims to answer two main questions: First, why are beta-2 agonists used in cattle feed? Second, why they are banned in some countries while approved in others?

Beta-adrenergic agonists are non-hormonal medications that work on the cellular level to enhance or reduce physiological responses that mimic the “fight-or-flight” response mediated by adrenaline. Therefore, these medications are used in the human medical field to manage multiple diseases such as cardiovascular and respiratory disorders.

**What is the role of these medications in cattle raising?**

Beta-2 agonists stimulate cellular receptors on fat cells of the animal, these receptors reduce the production of fat tissue while increasing the protein synthesis and muscle fibers size. Therefore, farmers can efficiently increase the lean body mass of their cattle with less food and water intake. Accordingly, beta-2 agonists are estimated to increase the US meat production by 1.5-2% which equates to 360 million pounds of lean beef a year without a significant increase in the price of production, providing the consumers with more meat for more affordable prices.

**How does the utilization of beta-2 agonists in cattle feed affect consumers’ health?**

Beta-2 agonists have a very short half-life which means that they remain for a short time in the animal body. The animal liver metabolizes them quickly and excretes them with the animal feces and urine. Therefore, no or minimal amounts of residual levels can be detected in the cattle meat. Additionally, meat produced from beta-2 agonist fed cattle are not allowed to be exported if residue limits exceed the maximum set by The Joint Food and Agriculture Organization of the United Nations World Health Organization Expert Committee on Food Additives (JECFA). The FDA which is responsible for regulating food for both humans and animals has approved the utilization of two beta-2 agonists (Optaflexx© and Zilmax©) in cattle feed 20 to 40 days before slaughter.

**Why do some countries prohibit the usage of beta-2 agonists for cattle feeding?**

Multiple studies analyzed the effect of beta-2 agonists on animals’ welfare. A study done by Guy Loneragan, the professor of food safety and public health in Texas Tech's College of Agricultural Sciences and Natural Resources, finds that cattle fed with beta-2 agonists have higher death rates compared to non-fed beta-2 agonists cattle. Other reports raised the awareness of the effect of beta-2 agonists on animals’ mobility and temperature. Therefore, some countries have banned the utilization of such drugs to preserve animals’ welfare, while other companies in the US such as Tyson Fresh Meats stopped temporarily accepting cattle fed with beta-2 agonist Zilmax© until a comprehensive study investigates these concerns.

**References:**

Beef Cattle (Penn State Extension). (2017). *Use of Beta-Agonists in Cattle Feed (Beef Cattle)*. [online] Available at: http://extension.psu.edu/animals/beef/nutrition/articles/use-of-beta-agonists-in-cattle-feed [Accessed 15 Jun. 2017].

Centner, T., Alvey, J. and Stelzleni, A. (2014). Beta agonists in livestock feed: Status, health concerns, and international trade. *Journal of Animal Science*, 92(9), pp.4234-4240.

Loneragan, G., Thomson, D. and Scott, H. (2014). Increased Mortality in Groups of Cattle Administered the β-Adrenergic Agonists Ractopamine Hydrochloride and Zilpaterol Hydrochloride. *PLoS ONE*, 9(3), p.e91177.

Network, U. (2017). *Beta-agonists: What are they and should I be concerned? | Announce | University of Nebraska-Lincoln*. [online] Newsroom.unl.edu. Available at: http://newsroom.unl.edu/announce/beef/2563/14863 [Accessed 11 Jun. 2017].

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