

Pork from ractopamine-fed pigs is safe for consumption

Despite recent decisions by some US packers to process only ractopamine-free pigs, it is important to understand that meat products are safe for consumers when ractopamine is used according to label directions.

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Ractopamine is the active compound in several products (e.g., Paylean®, Engain®) administered in-feed to pigs and other livestock. These products increase muscle growth rate and improve feed efficiency while reducing fat deposition. In the US, ractopamine has been commonly used in commercial finishing operations according to regulations set by the FDA. This product is also used in the exhibition industry to enhance muscling and appearance in show pigs.

Safety of Ractopamine

When considering the safety of any feed supplement or medication given to food animals, the US Food and Drug Administration (FDA) requires specific studies to determine how the formulated product behaves in both animals and people. In controlled safety and efficacy studies involving thousands of pigs, and a 20 year track record of safe use in hundreds of millions of finishing pigs, ractopamine has been shown to be a safe and effective feed supplement when administered at 5-10 ppm (4.5-9 grams/ton feed) during the last 21-28 days, corresponding to the last 45-90 pounds of weight gain at finishing.



When used according to the guidelines described above, levels of ractopamine measured in tissues collected at slaughter fall below the maximum residue limits (MRL) set by FDA of 15 ppb (meat) and 50 ppb (liver). These acceptable (or safe) concentrations of ractopamine, coupled with estimates of how much pork people typically consume in a day, are used to calculate an acceptable daily intake (ADI). The ADI is the amount of drug a human can consume over a 24 hour period without significant risk of an adverse health effect. Safety factors are built into this estimate to

account for individual differences (e.g., body weight, and actual amount of pork consumed). The MRL for ractopamine in pork meat (muscle tissue) is lower than it is for liver because consumers typically eat far more meat than organs such as, liver.

When ractopamine is used according to label guidelines the product exerts its positive actions but does not accumulate in muscle or liver tissues to levels greater than 50 ppb at slaughter. The reason for this is that ractopamine is rapidly metabolized to inactive molecules as it passes through the pig's liver and is rapidly excreted in urine and feces. These properties of ractopamine allow a zero-day withdrawal period in pigs, so producers can use the product safely right up to load-out, producing a safe product for consumers, efficiently.

Decision by some US packers to process only ractopamine-free pigs

In order to maintain access to international markets that ban even trace amounts of ractopamine in pork, several US packers have recently decided to process only pigs that are free of ractopamine. These decisions were driven mostly by the expanding US export market to China, where ractopamine-free pork is current policy and where domestic production has been reduced dramatically by an outbreak of African Swine Fever. That outbreak is slowly moving westward into the EU, which also has a zero-tolerance policy for ractopamine in pork.

China and EU require that pork meat be ractopamine-free. Though ractopamine is cleared rapidly from plasma and muscle, and is metabolically inactivated in the liver, it accumulates to much higher levels and persists longer in certain tissues, including liver, kidney, eye and hair. These tissues are not typically eaten by US consumers; some, however, are consumed in other countries, including China. The zero-tolerance policy for ractopamine in China and EU is also influenced by consumer safety events several years ago caused by improper use of clenbuterol, a different beta-agonist, and concerns over protecting their domestic pork industries from competition.

“Ractopamine-free” requires zero exposure to ractopamine

It should be assumed that ANY amount of the feed additive given at ANY time during the grow/finish phase could be detected in some of the pig's tissues, including hair for which studies show the feed additive persists for at least 42 days following exposure,

and probably much longer. Using modern assays, technicians at packing plants can detect ractopamine in muscle and other tissues at levels as low as 0.25 ppb as shown in this [paper](#). Note that these detection levels are much lower than the FDA recommended safe level for US pork.

Conclusions and recommendations

- Pork from ractopamine-fed pigs is safe for human consumption, providing the product is used according to label.
- Responding to changing demands of the global marketplace calling for ractopamine-free pork products, some processors no longer accept pigs fed supplements containing ractopamine.
- If your fair allows ractopamine and your pig will be processed for local (including US) consumption, then you will need to incorporate the product (or not) according to label directions.
- If your fair has a policy of not accepting ractopamine-fed pigs, don't use ractopamine at any time while raising your pig, and make sure that your vendor did not expose your pig to feed supplements containing ractopamine.

For additional web-based information about pork production, visit Michigan State University - Extension, [Pork Working Group](#) or contact: Dave Thompson, thom1637@msu.edu 269-832-8403, Casey Zangaro, zangaroc@msu.edu 785-285-2127, Beth Ferry, franzeli@msu.edu, 269-927-5674, or Nick Babcock, MSU-Extension, Veterinary/Livestock 4-H, babco116@msu.edu 517-432-1626.

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