

Use of beta agonists as a growth promoting feed additive for finishing beef cattle

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Growth promoters, such as implants and beta agonists, are available for use in cattle. Implants have been available for cattle producers since 1975, but beta agonists for beef cattle became commercially available in 2004. These growth promoters primarily change partitioning of energy from feed and shuttle more to muscle instead of fat deposition, thereby increasing weight gain, ribeye area, and total red meat yield when used. This factsheet will address frequently asked questions regarding use of beta agonists as growth promoter for finishing beef.

What is the difference between implants and beta agonists?

Implants are products containing natural and synthetic hormones and affect the hormone status of the animal to promote growth. Implants are placed in the ear of the cattle and require no withdrawal time prior to slaughter. Beta agonists are compounds where the effects occur at the cellular level and do not affect the hormone status of the animal, thus not a steroid. Additionally, beta agonists are medicated feed additives and withdrawal times can vary among products.

What beta agonists are currently available for use in cattle?

Optaflexx™ is a product available from Elanco Animal

Table 1. Characteristics of beta agonists approved for beef cattle.

Item	Optaflexx™	Zilmax™
Active ingredient	ractopamine hydrochloride	zilpaterol hydrochloride
Duration of feeding, d	28-42 days	20-40 days
Optimal feeding duration, d	28-35 days	20 days
Withdrawal time, d	None	3 days
Average daily gain, lbs/d	Increase from 9-21%	Increase from 14-40%
Feed efficiency (Feed:Gain)	Improve 9-21%	Improve 14-40%
Dressing percent	Minimal impact	1 to 2 percentage unit increase
Hot carcass weight, lbs	10 to 25 lbs increase	13 to 28 lbs increase
Ribeye area, sq.in	Up to 0.5 sq. in. increase	From 0.3 to 1.0 sq. in. increase
Marbling	Minimal impact	None to up to 25 degree reduction in marbling score
Tenderness	Minimal impact	None to reduction in 14 day Warner-Bratzler shear force up to 1.7 kg

Health. This product contains ractopamine hydrochloride as the active ingredient, which is the same compound that is in Paylean™ (labeled only for use in swine). Some feed supplements for show cattle are being marketed to contain this product.

Zilmax™ is a product available from Intervet, Inc. This product contains zilpaterol hydrochloride as the active ingredient. Zilmax™ is only available to licensed feedlots, whereas Showmaxx™ (show steer feed supplement) has been approved for sale directly to individuals.

What are the major differences between these products?

In general, Zilmax™ is a more potent beta agonist than Optaflexx™, whereas most studies have observed greater red meat yield with feeding Optaflexx™ verses Zilmax™. The differences between these two products in approved label guidelines and cattle performance are outlined in Table 1.

Are there any negative consequences to feeding beta agonists?

Research has not observed any negative affects on animal conformation. However, cattle with poor skeletal structure (post legged, straight fronted), the added muscle could cause these problems to become more evident.

Why are these products only labeled for use in the final days of the finishing period?

Market cattle become inefficient during the last month of the finishing period, because the animal is depositing less muscle and more fat. Beta agonists redirect energy to more protein synthesis rather than fat synthesis. This allows the animal to be more efficient during this period. When these products are fed to younger cattle these products demonstrate little or no response in muscle deposition or efficiency, thus results in not being cost effective to feed.

Why are these products not labeled to be fed for more days?

Research trials have reported these products are only effective for 28 to 35 days. After this time the performance returns to the level prior to using the products. The body adapts to the active ingredient during this time and thus loses its effectiveness. Note: Feeding the product for longer the label is also ILLEGAL.

What happens if you stop feeding the beta agonists?

Approximately 4 to 8 days after they are removed from the diet, performance will return to the same level prior to the use of the product. Therefore, the animal will start to shift more energy to fat synthesis rather than muscle deposition.

Can you feed more the recommended dosage?

No this is off label and ILLEGAL and veterinarians are not allowed to prescribe off label use of beta agonists. In addition, research trials have reported feeding these products at higher levels shows little to no improvement on animal performance or muscle deposition and is not cost effective.

What impacts do beta agonists have on carcass traits and meat quality?

Beta agonists partition more energy to muscle than fat deposition. Research studies have reported increased carcass weight and ribeye area at a similar fat thickness. When cattle are fed Optaflexx™, research has reported minimal impacts on quality grade and tenderness, whereas when cattle are fed Zilmax™, research results are mixed. Some studies have reported minimal impacts on quality grade and tenderness, while other have reported slight reductions in marbling resulting in less cattle grading USDA Choice and increase in toughness. The magnitude of response in these studies could have been influenced by biological type of cattle. In addition,

greater responses have been observed in cattle fed in small research pens versus in large commercial feedlot pens.

Is Paylean™ different than Optaflexx™?

Both have the same active ingredient, but fed at different concentrations. Paylean™ is only labeled for use in swine and Optaflexx™ is only labeled for use in cattle. These products can only be used in the species on the label. If used in other species this off label and ILLEGAL.

Can I feed these products to breeding stock (heifers or bulls)?

These products are NOT approved for use in breeding animals and this off label and ILLEGAL. Studies have not been conducted to know what the effects of these compounds have on reproduction.

****All medicated feed additives are to be used in accordance with the FDA approved label. Extra-label use of medicated feed additives is strictly prohibited by federal law and no one has the authority to adjust the dose as labeled, including veterinarians.***

Adapted from: The Facts about Optaflexx: Ractopamine for Cattle. J. Cleere. <http://animalscience.tamu.edu/images/pdf/beef/beef-optaflexx.pdf>

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