

BOVINE AND OVINE IMPLANTS



BASICS

OVERVIEW

- Implants are anabolic (growth-enhancing) substances that are implanted into the ears of cattle and sheep on the midcaudal subcutaneous region of the middle third ear. The implants are in a pelleted coated form that slowly release into the animal's bloodstream. Growth promoting implants have been used in the beef industry for over 50 years
- Bovine and ovine implants are slow release forms of natural or synthetic hormones used to primarily increase average daily gain, feed intake, feed efficiency, carcass weight and a reduce production costs.
- Implants may be used throughout the production cycle but have the most impact during the feeding phase. Results depend on available nutrition, age, sex and implant timing.
- Anabolic implants are classified as estrogenic, androgenic or progestogenic. The implants are composed of naturally occurring and/or synthetic hormones.

INCIDENCE/PREVALENCE

- Common in some countries and production systems

GEOGRAPHIC DISTRIBUTION

- Implant use is regulated in many countries
- Some countries do not allow use of hormonal implants for production animals

SYSTEMS AFFECTED

- Musculoskeletal
- Reproductive

PATHOPHYSIOLOGY

- Implants act through the endocrine system to increase growth of muscle tissue and alter the deposition of adipose tissue increasing average daily gain and feed efficiency.
- Estrogenic implants increase the production and release of hepatic somatotropin and insulin-like growth factor 1; allowing increased muscle accretion.
- Androgenic implants stimulate muscle production and decrease catabolism.
- Progestogen implants are primarily used to regulate the release of estrogenic compounds.

HISTORICAL FINDINGS

- N/A

SIGNALMENT

- Implants are available for both male and female animals and differ in their classification and dosage.
- The estrogenic compounds are generally more effective in castrated males while females generally are administered the androgenic steroids.
- The use of a combination of estrogenic and androgenic steroids can give an added response. Thus castrated males respond to a combination of an estrogen plus an androgen.
- Because females already secrete estrogens naturally, androgenic steroids given alone are effective.

PHYSICAL EXAMINATION FINDINGS

- N/A

GENETICS

- Response to implants may vary related to the genetic growth and development potential of the animal.

CAUSE AND RISK FACTORS

- Behavior side effects may include; bulling (sexual behavior, aggression and excitement)
- Physical side effects may include rectal prolapse secondary to bulling, mammary and teat development and elevated tail heads.
- Reproductive side effects can include delayed puberty, decreased conception in heifers, vaginal prolapse, increased dystocia and calf mortality in pregnant animals.



DIAGNOSIS

DIFFERENTIAL DIAGNOSIS

- N/A

CBC/BIOCHEMISTRY/URINALYSIS

- N/A

OTHER LABORATORY TESTS

- N/A

IMAGING

- N/A

DIAGNOSTIC PROCEDURES

- N/A

PATHOLOGIC FINDING

- N/A



TREATMENT

THERAPEUTIC APPROACH

- Nursing calves (Steers or heifers not destined for reproduction) receive implants of estrogen/progesterone or zeranol at birth or before 2 months of age. Effectiveness of the implants vary (200 to 400 days). Some recommend using a second implant
- Stocker calves are implanted every 90 to 100 days depending on the implant. Addition of an ionophore improve daily gain
- Feedlot calves: Several implants have been designed for treatment of feedlot steers or heifers.

SURGICAL CONSIDERATIONS AND TECHNIQUES

- N/A



MEDICATIONS

- Classifications: There are over 25 different types of implants depending on the type of molecule used
- Estrogenic: estradiol benzoate, Zeranol
- Androgenic; testosterone propionate, Trenbolone acetate
- Progestogenic; progesterone
- Combinations: estradiol benzoate/progesterone; estradiol benzoate/testosterone, estradiol/trenbolone acetate
- Antibiotic: oxytetracycline

CONTRAINDICATIONS

- Appropriate meat withdrawal times should be maintained.
- Growth promoting implants should not be used in animals intended for reproductive purposes
- Growth promoting implants should be limited to use in non-pregnant animals only.

PRECAUTIONS

- Proper placement and administration techniques should be followed with attention to implant site and needle hygiene.
- Crushing of implant pellets must be avoided.
- Implants used for estrous synchronization, vaccination against disease or chemical sterilization should not be confused for those used for growth promotion.

POSSIBLE INTERACTIONS

- Use of implants in animals intended for reproduction will affect fertility



FOLLOW-UP

EXPECTED COURSE AND PROGNOSIS

- Improved feed efficiency and weight gain.

POSSIBLE COMPLICATIONS

- Abscess or reaction at the site of administration.

CLIENT EDUCATION

- Selection and administration of the implants should be made in consultation with the veterinarian
- Protocol for administration and manufacturer guidelines should be followed
- Implants intended to synchronize or manipulate the estrus cycle should not be confused with implants intended to promote growth.

PATIENT CARE

- Implant sites should be observed for abscess formation.

PREVENTION

- N/A



MISCELLANEOUS

ASSOCIATED CONDITIONS

- Implants have been used in the United States effectively and safely for over fifty years
- Although numerous studies and scientific bodies have concluded that the use of hormones is safe Europe has banned the use of implants since 1988.
- The sheep growth response is similar to cattle but with lower relative increases in weight gain.
- Reported side effects include; delayed puberty, decrease fertility, bulling, mammary development, rectal prolapse and elevated tail head.

AGE RELATED FACTORS

- Older animals tend to have a more pronounced response than younger animal
- Timing of implant application may disrupt the onset of puberty

ZOONTIC POTENTIAL

- N/A

PREGNANCY

- Implants should not be used in pregnant animals. The use of growth promoting implants in pregnant animals may increase the percentage of dystocias and abortions

BIOSECURITY

- N/A

PRODUCTION MANAGEMENT

- Use of implants in suckling calves may aid in reaching production goals. Timing of administration and product choice should be considered in relation to production goals and marketing options.
- An increasing plane of nutrition is required in stocker calves to achieve the full potential of growth implants. Veterinarians and producers need to select an implant that corresponds with the length of time that cattle will be grazed. Implants should be selected to gain the highest level of effectiveness while the calves are being grazed.
- The use of growth implants in a feedlot setting require attention to detail to achieve the full benefit of the implant. Feed costs, genetic potential, rate of gain and timing to slaughter should all be considered to allow for optimum feed efficiency, rate of gain, and quality grades
- Implant sites should be monitored for abscess formation and all withdrawal periods should followed.

SYNONYMS

- Growth implants
- Growth-promoting implants
- Hormone implant
- Implants
- Steroidal implants

ABBREVIATION

- N/A

SEE ALSO

- Extra-label Drug Use and Compounding (www.fiveminutevet.com/ruminant)
- Food Animal Residue Avoidance Databank (FARAD) (www.fiveminutevet.com/ruminant)

SUGGESTED READING

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