IMPROPER DOSING USING AVERAGE CATTLE WEIGHTS

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Summary

A retrospective analysis of 6,231 head of stocker and feeder cattle comprising 24 separate lots was conducted to evaluate the extent and degree of improper dosing that would have occurred in individual animals if all animals in each lot were treated with a single dosage level of a pharmaceutical product based upon the average weight of the lot. Nine hundred forty-six head would have been overdosed by 10% or more, while 831 head would have been underdosed by 10% or more. Four hundred thirty-eight head would have been overdosed by 15% or more, while 366 head would have been underdosed by 15% or more. Two hundred and four head would have been overdosed by 20% or more, while 128 would have been underdosed by 20% or more. Ninety-eight head would have been overdosed by 25% or more, while 35 head would have underdosed by 25% or more.

Introduction

Most vaccines are designed so that a fixed dose of vaccine is administered irrespective of the size of the animal. Most pharmaceutical products are designed so that the dose to be administered varies based upon the weight of the animal. When utilizing pharmaceuticals, livestock producers commonly treat animals as a group based upon the average weight of the group, rather than determining individual weights and adjusting the dosage for each animal accordingly. As a result, some animals

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animals in the lot were compared to the average for the lot. When the actual weight of the individual was less than the average weight of the lot, the degree of overdosing was calculated. When the actual weight of the individual was greater than the average weight of the lot, the degree of underdosing was calculated.

**Results and Discussion**

Assuming that the average weight of each lot was used to determine the dosage of either an anthelmintic or a metaphylactic antimicrobial treatment for all animals in the lot, the extent and degree of potential individual animal improper dosing was calculated (Figure 1). Of the 6,231 head involved, 15.2% (946 head) would have been overdosed by 10% or more; 7.0% (438 head) overdosed by 15% or more; 3.3% (204 head) overdosed by 20% or more; and 1.6% (98 head) overdosed by 25% or more. Over 13.3% (831 head) would have been underdosed by 10% or more; 5.9% (366 head) underdosed by 15% or more; 2.1% (128 head) underdosed by 20% or more; and 0.6% (35 head) underdosed by 25% or more.

While the biological significance of improper dosing was not measured directly in these field studies, product-specific dose titration studies have previously shown that underdosing can contribute to lack of efficacy of dose-dependent products such as anthelmintics and antimicrobials.

![Figure 1. Overdosing and Underdosing Using Average In-Weights.](image-url)