PIG HEALTH TODAY®
NEW IDEAS FROM PIG RESEARCH
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discoveries

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- **Pelleting caused a 21% reduction in drug potency in feed manufactured with Terramycin® meal premix but only a 6% reduction in drug potency in feed manufactured with Aureomycin® granular premix.**
- **The large-particle composition of Aureomycin granular premix helped retain potency after pelleting. The Terramycin premix contained more than 40% fines and dust, which are often lost during feed processing.**

Aureomycin® granular premix retained higher potency than Terramycin® meal premix in study

The particle size and distribution of a medicated-feed premix can dramatically affect how much active ingredient ends up in a pig's digestive tract for disease treatment or control, according to the results of a study coordinated at a large Midwest feed mill.[1]

In a study comparing two tetracycline premixes, feed manufactured with Aureomycin® (chlortetracycline) granular premix maintained higher potency after the rigors of pelleting than the feed manufactured with Terramycin® (oxytetracycline) meal premix.

Aureomycin potency in feed declined only 6% after pelleting, compared to a 21% loss of Terramycin's potency.

Because of its large-particle size, Aureomycin best endured the high temperatures and humidity associated with pelleting. On the other hand, the Terramycin meal premix contained over 40% fines and dust, which can be lost during feed processing.

"As a result, the Aureomycin premix can deliver more antibiotic to a pig's digestive tract for disease treatment and control than the Terramycin meal premix," said Daniel A. Nelson, PhD, senior nutritionist and technical service specialist at Zoetis, who was involved with the study.

Feed mill study

For the study, the feed mill purchased Aureomycin 90 granular Type A premix (90 g chlortetracycline/pound of premix, Zoetis) and Terramycin 100 meal Type A premix (100 g oxytetracycline/pound of premix, Phibro Animal Health). Prior to feed manufacturing, investigators collected premix samples to determine particle-size distribution and medication activity.

The mill made five consecutive batches of swine grower-finisher feed containing Aureomycin or Terramycin. Adhering to label directions, investigators added each premix to the respective feed at 400 g/ton to provide a dose rate to animals of approximately 10 mg/pound bodyweight. The mill also used a soybean meal-corn flush between the two

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Figure 1. Aureomycin granular premix and Terramycin meal premix particle sizes

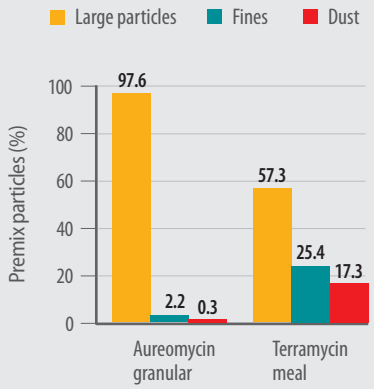
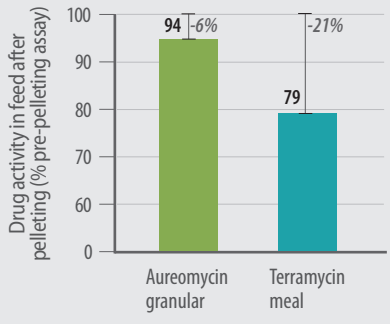


Figure 2. Average drug potency (and % loss) after pelleting for Aureomycin granular and Terramycin meal premixes



medicated feeds to clean out the system. Batches 2, 3 and 4 were designated as the test batches for each medication.

After mixing each test batch, investigators collected multiple "grab" samples from the mash leg to produce a representative composite sample for medication assay. These were designated as pre-pelleting samples.

All feeds were then pelleted, with an average pelleting temperature of 195° F (90.5° C). Investigators then collected three samples of cooled pellets for each medicated feed at 20, 25 and 30 tons throughput.

Test results

Laboratory assays on the premix before pelleting showed drug potency was slightly above label (104%) for both premixes. The test for particle size indicated Aureomycin granular premix contained 97.6% large particles and 2.5% fines and dust, compared to 57.3% large particles, 25.4% fines and 17.3% dust for the Terramycin premix (Figure 1).

Test results showed 97% of the active ingredient of Aureomycin granular premix was in the large particles. In the Terramycin premix, more than 75% of the active ingredient was in the fines and dust.

Drug assays of the pre-pelleted feed averaged 401 g/ton for feeds containing Aureomycin and 376 g/ton for those made with Terramycin. Drug assays of the post-pelleted feed averaged 378 g/ton for Aureomycin, compared to only 298 g/ton for Terramycin. Aureomycin potency in feed dropped by just 6% due to pelleting, compared to a 21% loss of active ingredient in feed manufactured from Terramycin meal premix (Figure 2).

In conclusion

"The Aureomycin granular premix was better able to survive the pelleting process with its large particles that contained the majority of the drug activity," Nelson said. "Large particles also provide less surface area for exposure to pelleting's adverse conditions."

In contrast, he added, almost half of the Terramycin premix was comprised of fines and dust which contained more than 75% of the drug activity. The Terramycin meal premix also lost substantial potency during pelleting. Studies have shown that fines and dust may cling to the side of a mixer, be left behind in an auger, end up in a dust collector or otherwise be lost during feed manufacturing, thereby reducing the drug potency of the manufactured feed.

"Aureomycin granular premix is formulated to potentially provide more active ingredient than Terramycin meal premix to a pig's digestive tract, which in turn could result in better disease treatment and control," Nelson said.

For more information, contact Dr. Nelson (daniel.nelson@zoetis.com) or your Zoetis representative

[1] Wolff T. Evaluation of premix characteristics and pelleting stability for Aureomycin granular and Terramycin meal premixes in a large midwestern USA feedmill. Proc Am Assoc Swine Vet. 2003;185-190.

Discoveries is a series of research news reports written by the editors of *Pig Health Today*® on behalf of the US Pork Business of Zoetis.

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