



Animal Health

Study to determine the in-feed mixing efficiency of Amoxi-sol FG in an Australian feed mill. Results on uniform dispersion and active recoveries

Prime Animal Health

Symbio Alliance Pty. Ltd., Queensland

An Australian stockfeed mill

Abstract

The aim of the trial was to determine the mixing efficiency and recovery in pelleted feed of Amoxi-sol FG in a compacted granular form.

A batch of swine feed was prepared under normal commercial production conditions. Four samples were taken at random from within the batch.

The samples were submitted to Symbio Alliance in Queensland for independent analysis. Assays were determined by LCMS.

It is concluded from the results that the Amoxi-sol FG compacted amoxicillin trihydrate distributes evenly throughout the feed mass and the recoveries were at the targeted levels.

Introduction:

In this study, carried out under commercial conditions, the mixing performance and recoveries of Amoxi-sol FG compacted amoxicillin trihydrate was evaluated and recorded.

An independent laboratory made the analysis. The implications of the results obtained are discussed in detail within the context of feed additive technological performance.





Animal Health

Methods

Feed Preparation

A Batch of swine feed pellets was manufactured under normal commercial conditions and the Amoxi-sol FG was added at a theoretic value of 500mg/kg Amoxicillin

Sampling

Four samples of medicated pelleted feed were taken at random from within the batch following the production. All samples were submitted to Symbio Alliance, Brisbane for analysis. (SYMBIOⁱ). The theoretic levels were not identified so that analyses were conducted blind. In addition, a sample of the Amoxi-sol FG used in the production was supplied for analysis to validate the analytical method.

Analytical Methods

Amoxicillin trihydrate assays were made on each sample using LCMS methodⁱⁱ. For reasons of confidentiality only limited details are given.

Feed samples were prepared for analysis by blending and extracting a portion of the blend in mobile phase. An aliquot of the filtered extract was used for the determination.

Statistical Analysis of Results

Means and Standard Deviation (SD) σ_{n-1}

The means and SDs (σ_{n-1}) of Amoxicillin assays were calculated.

Coefficients of Mixing Variation (CV%)

The CVs were calculated as follows:

$$CV = \frac{\sigma_{n-1}}{\mu} \times 100$$





Animal Health

Results for Amoxicillin recovery and distribution

The assay results and the statistical parameters calculated from these are shown in Tables 1 and 2.

Table 1.
Amoxicillin Assay Results (mg/kg) – Target 500mg/kg

| SAMPLE NUMBER | LEVEL in mg/kg |
|--------------------------|-----------------------|
| 1 | 510 |
| 2 | 511 |
| 3 | 492 |
| 4 | 503 |

Table 2.
Statistical parameters for Assay Results Shown in Table 1.

| | Amoxi-sol FG |
|-------|-------------------------|
| Mean | 505 |
| SD | 7.19 |
| CV% | 1.64 |
| Range | 492 - 511 |
| Range | 19 |





Animal Health

Discussion

1. Feed produced using Amoxi-sol FG gave an excellent recovery within a commercial feed batch.
2. The CV(%) for the feed produced using Amoxi-sol FG was 1.64% assuring accurate dosing of the target animal
3. The active recovery for the batch produced with Amoxi-sol FG was 492 - 511mg/kg with a mean value of 505. (Target was 500mg/kg). This ensures doses remain within the required parameters and eliminate the potential for active toxicity in some species, and ensure the antibiotic is not administered in sub therapeutic doses.

Conclusions

1. From the results obtained in this study it is reasonable to conclude that Amoxi-sol FG (amoxicillin trihydrate in a compacted granular) has significant impact on the recovery and dispersion when used in the production of stockfeed under normal production conditions.
2. The physical characteristics of a feed additive contribute significantly to the technological performance of that additive in the feed production process.

References

ⁱ Symbio Alliance, Brisbane, Queensland.

ⁱⁱ Symbio Alliance Method for the determination of amoxicillin, LCMS method: modification for use with stockfeed

