

# SYRINGEABILITY AND VISCOSITY COMPARATIVE OF DIFFERENT FLORFENICOL FORMULATIONS

S. Colomer<sup>1</sup>, E. Puigvert<sup>2</sup>, E. Pol<sup>2</sup>

<sup>1</sup>HIPRA, Marketing Department, Spain, <sup>2</sup>HIPRA, Research and Development Department, Spain, susanna.colomer@hipra.com

## OBJECTIVE

The aim of this study is to compare easiness of injection of different florfenicol formulations.

## INTRODUCTION

Several factors have an influence on adherence to prescription. Easy administration route, short treatment duration, minimum number of injections per day, etc.... Parenteral administration requires comfort and safety properties of the drug, being the syringeability one of the most important. The high fluidity is a key factor on a parenteral treatment allowing more animals to be treated in less time and causing them less stress.

## MATERIALS AND METHODS

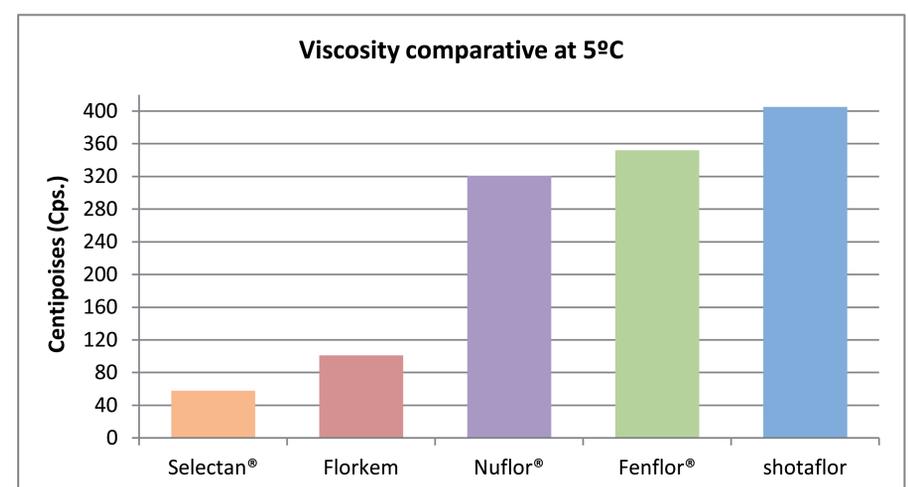
A total of 5 different florfenicol formulations were compared. The commercial suspensions tested, all 300 mg/ml florfenicol, were: Fenflor<sup>®</sup>, Florkem, Nuflor<sup>®</sup>, Shotaflor and Selectan<sup>®</sup>, five antibiotics commonly used for the treatment and control of the Bovine Respiratory Disease Complex. For the syringeability comparison, the time needed to expel 10 ml of five products was calculated. A glass syringe (Fortuna, optima H) with a 17G needle (1.5 – 15mm, 17G x 12", 15x15) was used. To obtain the right pressure for constant expulsion of the product a 200g weight (equivalent to 19.6 Newton force) was used. This method was repeated ten times with each solution after storage at 5°C. Results provided are the average +/- standard deviation and statistical analysis, based on a Student's t-test. For the viscosity measurement, a Brookfield laboratory viscometer was used. This test was done with the 5 solutions.

## RESULTS

At 5°C, the times needed to empty the syringe for the 5 tested products were: Fenflor<sup>®</sup>: 133 +/- 9.2s,

Florkem: 56.6 +/- 1.5s, Nuflor<sup>®</sup>: 103.5 +/- 3.8s, Shotaflor: 146 +/- 16.7s and Selectan<sup>®</sup> 26.4 +/- 1.3s. All these differences are significant (P > 0.05). For the viscosity measurement the results of the five commercial products at 5°C were: Fenflor<sup>®</sup>: 352 Centipoises, Florkem: 101 Centipoises, Nuflor<sup>®</sup>: 321 Centipoises, Shotaflor: 405 Centipoises and Selectan<sup>®</sup> was the less viscous formulation showing a value of 58 Centipoises. Results for the viscosity are shown in Fig. 1.

**Figure 1.** Viscosity (Centipoises) comparative of 5 different florfenicol formulations.



## CONCLUSIONS AND DISCUSSION

All together, these findings indicate that the syringeability of the formulation is inversely proportional to its viscosity. The difference in performance between the products can be explained by different excipients in their formula. Glycerol formal allows a less viscous formulation than Glycol propylene. Selectan<sup>®</sup> is the less viscous product providing a better syringeability. This high fluidity is a key factor on a parenteral treatment, allowing more animals to be treated in less time and causing less stress.



Hipra Philippines, Inc.  
Unit 308 Venture Building,  
Venture cor. Prime Sts,  
Madrigal Business Park,  
Ayala Alabang, Muntinlupa City,  
Philippines

Tel.: (+632) 828.9886  
Fax: (+632) 856.4923  
hipra@hipra.com  
www.hipra.com