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2017

# Comparison of Titanium<sup>®</sup> 5 PH- M versus Titanium<sup>®</sup> 5 plus NUPLURA<sup>®</sup> PH with the Presence or Absence of Monensin on Health and Performance of Newly Received Feedlot Calves Fed RAMP<sup>®</sup>

Robert M. Jones

*University of Nebraska - Lincoln*

Curtis J. Bittner

*University of Nebraska-Lincoln, [curtis.bittner@unl.edu](mailto:curtis.bittner@unl.edu)*

F. Henry Hilscher Hilscher

*University of Nebraska-Lincoln, [henry.hilscher@unl.edu](mailto:henry.hilscher@unl.edu)*

Mallorie F. Wilken

*University of Nebraska-Lincoln, [mfwilken@gmail.com](mailto:mfwilken@gmail.com)*

Rick Stock

*University of Nebraska - Lincoln, [rstock3@Unl.edu](mailto:rstock3@Unl.edu)*


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Jones, Robert M.; Bittner, Curtis J.; Hilscher, F. Henry Hilscher; Wilken, Mallorie F.; Stock, Rick; and Erickson, Galen E., "Comparison of Titanium<sup>®</sup> 5 PH- M versus Titanium<sup>®</sup> 5 plus NUPLURA<sup>®</sup> PH with the Presence or Absence of Monensin on Health and Performance of Newly Received Feedlot Calves Fed RAMP<sup>®</sup>" (2017). *Nebraska Beef Cattle Reports*. 934.  
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**Authors**

Robert M. Jones, Curtis J. Bittner, F. Henry Hilscher Hilscher, Mallorie F. Wilken, Rick Stock, and Galen E. Erickson

# Comparison of Titanium<sup>®</sup> 5 PH-M versus Titanium<sup>®</sup> 5 plus NUPLURA<sup>®</sup> PH with the Presence or Absence of Monensin on Health and Performance of Newly Received Feedlot Calves Fed RAMP<sup>®</sup>

Robert M. Jones  
Curt J. Bittner  
F. Henry Hilscher  
Mallorie F. Wilken  
Rick A. Stock  
Galen E. Erickson

## Summary with Implications

A receiving study was conducted to evaluate the effects of RAMP<sup>®</sup> with Rumensin<sup>®</sup> concentration (0 or 25.0 g/ton) given with one of two viral vaccinations (Titanium<sup>®</sup> 5 PH-M or Titanium<sup>®</sup> 5 plus NUPLURA<sup>®</sup> PH) on steer growth performance and morbidity. There were no significant vaccine by diet interactions observed. Neither vaccine treatment nor Rumensin<sup>®</sup> level affected intake, gain, or feed conversion. Vaccine type did not affect first pull ( $P = 0.19$ ) or second pull morbidity rates ( $P = 0.52$ ). These findings suggest that neither vaccine type nor Rumensin<sup>®</sup> concentration had any effect on steer growth performance or morbidity rate.

## Introduction

Rumensin<sup>®</sup> (Elanco Animal Health) is an ionophore that has been shown to alter the rumen microbial population and is widely used in the feedlot industry to improve feed efficiency. However, there has been limited current research evaluating the performance and morbidity impacts of feeding Rumensin<sup>®</sup> during the adaptation or receiving period in feedlot steers. A common perception is that calves cannot be started on Rumensin<sup>®</sup> without decreasing intake dramatically. The most prevalent disease in the beef industry is bovine respiratory disease (BRD). Respiratory disease can be caused by a combination of viral and bacterial pathogens, usually as a result of stress factors all interacting to cause morbid cattle. Titanium<sup>®</sup> 5 PH-M (VacPH-M) and

Titanium<sup>®</sup> 5 + NUPLURA<sup>®</sup> PH (VacPH) (Elanco Animal Health) are both BRD vaccinations intended for beef cattle. The vaccine VacPH-M is labeled to deliver effective immune response against bacteria (*Mannheimia haemolytica* and *Pasteurella multocida*) and viruses (bovine viral diarrhea (BVD) types 1 and 2, infectious bovine rhinotracheitis (IBR), parainfluenza-3 virus (PI<sub>3</sub>) and bovine respiratory syncytial virus (BRSV)). The vaccine VacPH is labeled similarly to VacPH-M excluding protection against *Pasteurella multocida*. One common practice for receiving cattle today is feeding RAMP<sup>®</sup>, a complete starter product (Cargill Corn Milling) which contains a high level of Sweet Bran<sup>®</sup> and a minimal amount of forage (2013 Nebraska Beef Report, pp. 84–85). The objective of this study was to evaluate the effects of VacPH-M versus VacPH on steer growth performance and morbidity over a 28-d receiving period when steers are fed RAMP with or without Rumensin<sup>®</sup>.

## Procedure

A feedlot receiving study was conducted to determine the effectiveness of vaccine at arrival on growth performance and health of steers over a 28-d receiving period when fed RAMP with 0 or 25 g/ton (DM basis) of Rumensin<sup>®</sup>. The experiment was conducted at the University of Nebraska-Lincoln Eastern Nebraska Research and Extension Center (ENREC) near Mead, NE. Crossbred steers ( $n = 704$ ; initial BW =  $593 \pm 49$  lb) were utilized in a randomized block design with a 2×2 factorial treatment design. Upon arrival, steers were allowed access to water and processed within 6 hours. Steers were weighed on d 1 to establish initial BW. Steers were assigned to one of four treatments (pen) based on processing order with steers assigned singly to treatment in sets of 4, and repeated until 4 pens were filled (1 replicate). Once a pen replicate was filled, new pen replicates were started until all steers were assigned to 40

pens (10 pens per simple effect treatment) with 14–21 steers per pen (equal steers/pen within block). During processing on d 1, all steers were identified with an individual ear tag (3 tags total), individually weighed, and vaccinated with Somnu Shield<sup>®</sup> (Novartis Animal Health) administered at 2ml/steer and Dectomax<sup>®</sup> injectable (Zoetis Animal Health) administered at 1ml/110 lb of BW. Steer ID was utilized for treatment assignment to vaccine treatment based on odd or even numbers. All odd number ID tags were vaccinated with VacPH-M (2ml/steer), while all even numbered tags were vaccinated with VacPH (2ml/steer).

All four treatments were fed a common diet consisting of 97% RAMP and 3% fine ground corn based supplement (DM Basis). Supplements contained either 0 or 25 g/ton of Rumensin<sup>®</sup> (DM basis). Both supplements contained 435 g/ton of decoquinatone (Deccoq<sup>®</sup>; Zoetis Animal Health). After the 28-d receiving trial, steers were limit-fed (to minimize gut fill variation) a diet of 50% forage, 50% Sweet Bran (DM basis) at 2% of BW for 5 consecutive days before weighing for ending BW. Ending BW was an average of 2 consecutive day weights collected before feeding each day.

Performance data (BW, DMI, ADG, G:F) were analyzed using the MIXED procedure of SAS (SAS Inst., Inc., Cary, N.C.) with pen as the experimental unit. The model included Rumensin<sup>®</sup>, vaccine, and Rumensin<sup>®</sup> × vaccine interaction. Block (arrival) was included in the model as a fixed effect. Morbidity incidence was evaluated as the number of first treatments or the number of steers treated in the pen divided by the total number of steers in the pen. Additionally, the morbidity rate of two or more treatments was calculated as the number of steers treated two times divided by the total number of steers treated once. Morbidity data were analyzed with the GLIMMIX procedure of SAS using a binomial distribution and a logit-link function.

**Table 1. Main effect comparisons of feeding Rumensin<sup>†</sup> and vaccine type on performance and morbidity over a 28-d receiving period.**

| Item                        | Rumensin <sup>†</sup> |          |         | Vaccine <sup>1</sup> |       |         | SEM  | Interaction |
|-----------------------------|-----------------------|----------|---------|----------------------|-------|---------|------|-------------|
|                             | 0 g/ton               | 25 g/ton | P-value | VacPH-M              | VacPH | P-value |      |             |
| Initial BW, lb              | 592                   | 594      | 0.75    | 596                  | 591   | 0.46    | 5.0  | 0.55        |
| Ending BW, lb               | 680                   | 682      | 0.83    | 683                  | 679   | 0.58    | 6.0  | 0.59        |
| DMI, lb/day                 | 13.7                  | 13.4     | 0.28    | 13.6                 | 13.4  | 0.52    | 0.2  | 0.94        |
| ADG, lb                     | 3.28                  | 3.27     | 0.94    | 3.28                 | 3.27  | 0.95    | 0.09 | 0.81        |
| Feed:Gain <sup>2</sup>      | 4.14                  | 4.08     | 0.65    | 4.13                 | 4.09  | 0.79    | -    | 0.79        |
| <b>Morbidity</b>            |                       |          |         |                      |       |         |      |             |
| First pull, % <sup>3</sup>  | 22.6                  | 17.4     | 0.10    | 22.0                 | 17.9  | 0.19    | 2.3  | 0.38        |
| Second pull, % <sup>4</sup> | 22.5                  | 13.8     | 0.21    | 15.7                 | 20.0  | 0.52    | 5.3  | 0.27        |

<sup>1</sup> VacPH-M is Titanium 5 PH-M and VacPH is Titanium 5 +Nuplura PH.

<sup>2</sup> Gain:Feed analyzed statistically, which is the reciprocal of Feed:Gain.

<sup>3</sup> Percentage of steers treated one or more times as a % of total steers within the pen.

<sup>4</sup> Percentage of steers treated two or more times, expressed as a % of steers pulled once.

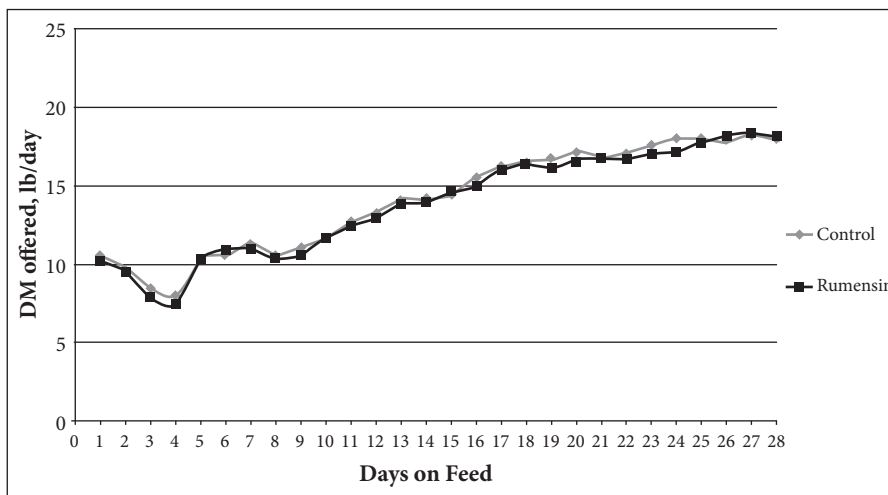


Figure 1. Daily DM offered to steers consuming a RAMP diet with or without Rumensin<sup>†</sup>.

## Results

No significant Rumensin<sup>†</sup> × vaccine interactions ( $P > 0.27$ ) were noted for growth performance or morbidity (Table 1). Rumensin concentration did not affect DMI ( $P = 0.28$ ), ADG ( $P = 0.94$ ), F:G ( $P = 0.65$ ), or ending BW ( $P = 0.83$ ). While steers fed Rumensin<sup>†</sup> ate less feed numerically, the difference was small (2%) and was not statistically significant. The DM offered across the 28-day receiving period is shown in Figure 1. The DM offered was consistent across both treatments. There was a tendency ( $P = 0.10$ ) for steers fed 25.0 g/ton of Rumensin<sup>†</sup> to have a lower percentage of first and second pulls as compared to steers receiving 0 g/ton of Rumensin<sup>†</sup>.

Vaccine type did not affect DMI ( $P = 0.52$ ), ADG ( $P = 0.95$ ), F:G ( $P = 0.79$ ), or ending BW ( $P = 0.58$ ). The number of steers pulled and treated for BRD one or more times was not different ( $P = 0.19$ ) for VacPH-M compared to VacPH. However, the numerical difference between vaccine types was similar to the numerical difference between steers fed Rumensin<sup>†</sup> or not. While not significant, steers vaccinated with VacPH had numerically lower first pulls. No difference ( $P = 0.52$ ) was observed when comparing second pull rates between vaccine types.

## Conclusion

Results suggest that neither vaccine type nor Rumensin<sup>†</sup> concentration had any effect on steer growth performance or morbidity rate for the first 28-d of receiving. Including Rumensin<sup>†</sup> from day 1 of receiving does not dramatically alter DMI of newly received calves.

Robert M. Jones, graduate student

Curt J. Bittner, research technician

F. Henry Hilscher, research technician

Mallorie F. Wilken, Elanco Animal Health

Rick A. Stock, Cargill, Blair, NE

Galen E. Erickson, professor, Animal Science, Lincoln