



## Analysis of Post-Vaccinal Injection Sites Using Ultrasound

### Summary

Cattle injected with VISION® 7 vaccine (2mL) had smaller injection-site reactions at 7 and 30 days post-vaccination, both in surface area and depth, than cattle injected with Bar-Vac® 7, a 5mL, 7-way clostridial vaccine. Calipers were used to measure gross size of injection blemishes, while ultrasound was used to measure depth or thickness of the tissue reactions.

### Introduction

Accurate evaluation of injection-site lesions has historically been done at the slaughterhouse. A non-invasive technique utilizing ultrasound was evaluated by North Carolina State University. Ultrasound could become a valuable tool as the industry evaluates the impact of new biologicals and pharmaceuticals with respect to injection-site blemishes.

### Materials and Methods

Seventy-four head of cattle on one farm (avg. weight of 608 lb.) and 95 head of cattle on a second farm (avg. weight of 449 lb.) were included in the study. Cattle on each farm were randomly assigned to receive either VISION 7 or Bar-Vac 7. Cattle were injected on day 0, subcutaneously on the side of the neck using a 16 gauge x 1-inch needle. Injection-site measurements were taken on days 7 and 30 post-vaccination. Surface area measurements were taken using a caliper (standard vernier caliper, Fischer Scientific, Pittsburgh, Pa.). Depth measurements were taken using ultrasound (Interspec XL ultrasound machine and 7.5-m H<sub>2</sub> transducer with a fluid offset, Interspec, Conshohocken, Pa.).

Table 1: Surface Area and Depth Measurements for Injection-Site Blemishes on Farm 1

	2mL VISION® 7 Vaccine (n=37)		5mL Bar-Vac® 7 Vaccine (n=37)	
	Surface Area (mm <sup>2</sup> )	Depth (mm)	Surface Area (mm <sup>2</sup> )	Depth (mm)
Day 7	2,333±1,358†	11.5± 7.6	2,667±1,334	13.8±9.0
Day 30	793±1,623†	9.1±6.2	3,019±1,770*	13.2±6.9
% Change in Mean Blemish Size	66% Reduction	20% Reduction	13% Increase	4% Reduction

† P=.002 Mean reaction area significantly different between days 7 and 30, within the same-treatment cattle group.  
 \* P=.001 Mean reaction area significantly different between treatment groups A and B on the same day.

Table 2: Surface Area and Depth Measurements for Injection-Site Blemishes on Farm 2

	2mL VISION® 7 Vaccine (n=48)		5mL Bar-Vac® 7 Vaccine (n=47)	
	Surface Area (mm <sup>2</sup> )	Depth (mm)	Surface Area (mm <sup>2</sup> )	Depth (mm)
Day 7	1,568±719 <sup>†</sup>	15.9±6	2,853±1,605 <sup>*</sup>	15.0±8.0
Day 30	774±744 <sup>†</sup>	13.1±6.8	2,736±1,373 <sup>*</sup>	15.8±7.1
% Change in Mean Blemish Size	51% Reduction	17% Reduction	3% Reduction	5% Increase

<sup>†</sup> P=.002 Mean reaction area significantly different between days 7 and 30, within the same-treatment cattle group.  
<sup>\*</sup> P=.001 Mean reaction area significantly different between treatment groups A and B on the same day.

## Conclusions

Cattle injected with VISION 7 experienced a significant reduction in post-vaccination reaction-site blemishes when comparing day 7 to day 30. Blemishes in cattle vaccinated with Bar-Vac 7 had limited reductions in size and depth. In fact, increases in size or depth during the 30-day observation period were substantial.

Analysis of percent reduction in blemish size from day 7 to day 30 demonstrates cattle from Farm 1 that received VISION 7 experienced a 66% reduction in area size and a 20% reduction in thickness. Cattle that received Bar-Vac 7 had a 13% increase in area size and only a 4% reduction in blemish thickness.

Cattle on Farm 2 that received VISION 7 experienced a 51% reduction in area size and a 17% reduction in thickness. The cattle injected with Bar-Vac 7 experienced only a 3% reduction in area size and a 5% increase in blemish thickness.

## Discussion

With the beef industry focused on quality assurance and reduction in blemishes in retail beef, it's important for producers to consistently produce cattle with a proven record of few injection-site blemishes. Veterinarians play an important role in counseling producers on the selection and use of animal health products, including clostridial vaccines. Comparison studies of VISION 7 and VISION 8 vaccines<sup>1-11</sup> to other 5mL and 2mL dose vaccines indicate selection and proper use of a less-reactive 2mL dose multivalent clostridial vaccine can improve economic performance and/or beef quality.

The use of ultrasound in measuring injection-site blemishes shows promise as a non-invasive tool to evaluate injection-site blemishes as new injectable biologicals and pharmaceuticals are developed.

## References:

1. Intervet Field Trial Report 92-3
2. Intervet Field Trial Report 93-3
3. Intervet Field Trial Report 93-5
4. Intervet Field Trial Report 93-6
5. Intervet Field Trial Report 93-8
6. Intervet Field Trial Report 93-9
7. Intervet Field Trial Report 93-14
8. Intervet Field Trial Report 93-15
9. Intervet Field Trial Report 96-3
10. Intervet Field Trial Report 96-4
11. Intervet Field Trial Report 96-5