



Evaluation of Injection-Site Blemishes Using Ultrasonography Following Administration of Two Commercial Multivalent Clostridial Vaccines

Summary

Cattle vaccinated with the Vision® 7 (2mL) vaccine featuring the SPUR® adjuvant exhibited fewer and smaller post-vaccinal injection site blemishes than cattle vaccinated with the Alpha-7™, 2mL, oil-adjuvanted vaccine. When present 7 and 30 days after administration, injection-site blemishes in cattle vaccinated with Vision 7 were smaller in size and depth than blemishes found in cattle administered the Alpha-7™ oil-adjuvanted vaccine.

Introduction

Vaccination against clostridial disease is a common and important management practice in cattle production. Current concerns about beef quality assurance (BQA) and injection-site blemishes has motivated the beef industry to focus on the use of clostridial vaccines labeled for subcutaneous administration. With the focus on subcutaneous administration, post-vaccinal tissue reactions become more apparent. Therefore, producers, buyers and feeders benefit by using clostridial vaccines that have minimal post-vaccinal reactions.

In the development of new injectable animal health products, new techniques are being developed to aid in the evaluation of post-administration site reactions on the

live animal. Ultrasonography is proving to be a valuable tool to analyze post-vaccinal reactions, and compare relative reactivity between vaccines or other injectable animal health products.

Materials and Methods

A group of 77 cross-bred beef cattle, weighing between 440 and 660 lbs. (200 and 300 kg) were used in this study. The cattle were from several sources and had no known vaccination history. Cattle were randomly assigned to one of two vaccinal groups: Group A received a 2mL dose of Alpha-7™ oil-adjuvanted vaccine and Group B received a 2mL dose of Vision 7 with SPUR adjuvant. Vaccine was administered subcutaneously on the right side of the neck, using a multi-dose, pistol-grip syringe with a 16-gauge, 3/4-inch needle. Needles were changed every 10 animals.

Injection site swellings were measured on Day 7 and Day 30 following vaccination. The size of injection site reaction was measured using a Vernier caliper and the depth of the swelling was measured using ultrasound.

Table 1 - Injection reaction size and depth (mean ± sd) measured in mm²

	Vision 7 Vaccine (2mL)		Alpha-7™ Oil-Adjuvanted Vaccine (2mL)	
	Area (mm ²)	Depth (mm ²)	Surface Area (mm ²)	Depth (mm ²)
Day 7	1466±1204 [†]	11.6±4.2 [£]	3346±2546	16±7.4 ^{£#}
Day 30	725±1563 ^{†*}	13.2±6.6 [§]	3233±3339 [*]	19±8.9 ^{§#}
Percent Change	50% reduction	13% increase	3% reduction	20% increase

p=.013 § p≤.005 £ p≤.005 Note: To statistically compare values, match data figures having like superscripts
* p=.005 † p=.0000

Table 2 - Number and percent of animals exhibiting post-vaccinal swelling

	Vision 7 Vaccine (2mL)		Alpha-7™ Oil-Adjuvanted Vaccine (2mL)	
Day 7	29/38	76%	32/39	82%
Day 30	17/37	46%	28/37	76%

Discussion

On Day 7 the average measured area of injection site swellings in the Vision 7 with SPUR adjuvant vaccinated cattle was 2.3 times smaller than those measured for animals that received the Alpha-7™ oil-adjuvanted vaccine (Table 1). On Day 30 the average measured area of reaction in cattle that received Vision 7 was 4.5 times smaller than observed in cattle given the Alpha-7™ oil-adjuvanted vaccine (Table 1). The area of swellings reduced by only 3% from Day 7 to Day 30 in cattle that received the Alpha-7™ oil-adjuvanted vaccine. In comparison, swellings in Vision 7 injected cattle diminished in size by 50% (Table 1). In earlier studies, Vision 7 has been found to be less reactive than multivalent 5mL clostridial vaccines. In this study, Vision 7 with

SPUR adjuvant produced statistically and clinically fewer injection site blemishes than the 2mL, Alpha-7™, oil-adjuvanted, multivalent clostridial vaccine.

Veterinarians and cattle producers should carefully select and use multivalent clostridial vaccines. Injection site blemishes following administration of reactive clostridial vaccines have been shown to affect performance of pastured and fed cattle, and to contribute to increased carcass trim:²⁸ Use of Vision 7 with SPUR adjuvant can provide protection against clostridial diseases, as well as minimize losses attributed to injection site blemishes.

1. Interspec (model XL), Conshohocken, PA. 7.5 MHz sector transducer with adapted fluid offset.
 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 93-9
 6. Intervet Field Trial Report 93-14
 7. Intervet Field Trial Report 93-15
 8. Intervet Field Trial Report 96-1