

# The Presence of Infectious Bovine Rhinotracheitis Virus (IBR), Bovine Viral Diarrhea Virus (BVD), Bovine Respiratory Syncytial Virus (BRSV) and Parainfluenza Virus (PI3) in Non-Vaccinated Beef and Dairy Cattle in Mexico Detected by an Enzyme Linked Immunosorbent Assay (ELISA) Method

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## Introduction

The role of IBR, BVD, BRSV and PI3 in the Bovine Respiratory Complex is well documented.<sup>1,2,3,4</sup>

Several authors in Mexico have studied outbreaks of the disease or conducted seroepidemiologic studies to detect antibodies against the four viruses in various geographical areas of Mexico.<sup>5,6,7,8,9,10</sup>

The percentage of animals positive to these viruses in the various surveys has been reported as follows: IBR from 6.11 to 84%, BVD 6.11 to 100%, BRSV 55-100% and PI3 from 40-73.12%. Recently, the Animal Health authorities have listed the four diseases as Enzootic Diseases which exist in Mexico and of immediate and mandatory report.<sup>11</sup>

The objective of this work was to conduct a serological survey in non-vaccinated cattle in both beef and dairy operations against four primary cattle viruses to detect prevalence and spread within the country.

## Material and Methods

Serum samples were obtained from non-vaccinated beef and dairy cattle of mixed breeds and age, regardless of their health status from 12 states of Mexico: Baja California, Campeche, Chiapas, Colima, Hidalgo, Jalisco, Michoacán, Nayarit, Puebla, Sinaloa, Tabasco and Veracruz, and sent ice-packed to a diagnostic laboratory\* for detection of antibodies against the four viruses with a commercial ELISA Kit.\*\* A total of 634

serum samples from 54 herds were studied, 44 of the 54 herds were beef cattle, mainly Zebu, and 10 herds were dairy operations, predominantly Holstein.

In 43 of the 44 beef herds and in 9 of the 10 dairy herds, evaluation against the four viruses was performed. In the remaining 2 herds tests were only conducted against BRSV and BVD in one case and IBR and BVD in the other. A total of 521 animals were tested against IBR, 634 against BVD, 586 against BRSV and 573 for PI3.

All procedures were carried out according to the manufacturers' recommendations; readings of the samples were conducted utilizing a Hyperion Micro reader with a 450 nm absorbance cell.

## Results

In 52 of the total 54 herds detection of antibodies against the four viruses yielded the following results: 44 herds (84.61%) had antibodies to the four viruses simultaneously, 5 herds (9.61%) had antibodies to 3 viruses, whereas only 2 herds (3.8%) showed the presence of 2 viruses. Also 1 herd (1.9%) had antibodies against 1 virus, none of the 52 herds were completely seronegative. Individually, a total of 621 animals were tested against IBR with 341 positives (54.91%) 355 out of 634 were positive to BVD (55.99%), 389/586 to BRSV (66.38%) and 73.12% positive to PI3 (419/573). The absorbance levels of 0.4 <cf for IBR and 0.3 <cf for BVD, PI3 and BRSV or higher were considered as positive samples for this study.

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Table 1 shows the percentage of animals positive to IBR, BVD, BRSV and PI3 expressed by type of operation.

Table 1.

# Herds	Positive to IBR	Positive to BVD	Positive to BRSV	Positive to PI3
Beef 44	289/526 54.94%	285/526 54.18%	304/478 63.59%	341/478 71.33%
Dairy 10	52/95 54.73%	70/108 64.81%	85/108 78.70%	78/95 82.10%
Total	341/621 54.91%	355/634 55.99%	389/586 66.38%	419/573 73.12%

# Positive / # Tested

### Discussion

The presence of IBR, BVD, BRSV and PI3 is widespread in Mexico. The continuous movement of cattle and frequent importation of animals from other countries where the viruses are present has contributed to the spread of these pathogens. The results from this study as well as the previously reported figures are similar to the prevalence data of these viruses in the USA and Canada from which Mexico frequently imports cattle.<sup>12,13</sup> Vaccination programs against these viruses should be an integral part of herd management in this country.<sup>14</sup>

### Summary

A serological survey of 12 states of Mexico against IBR, BVD, BRSV and PI3 by an ELISA method showed a seroprevalence of 54.91%, 55.99%, 66.38% and 73.12% in nonvaccinated beef and dairy cattle. In beef animals the results were 54.94% positive for IBR, 54.18% for BVD, 63.59% for BRSV and 71.37% for PI3, whereas in dairy cattle the percentage of seropositive animals was 54.73% for IBR, 64.81% for BVD, 78.70% for BRSV and 82.10% for PI3. 84.61% of the herds tested (44) were positive to the four viruses simultaneously, 9.61% (5 herds) had antibodies against three viruses, 2 herds (3.8%) were positive to two viruses and one herd to one virus (1.92%); no herds were found completely seronegative to any of these four viruses.

### Resumen

Se llevó a cabo un estudio serológico en ganado no vacunado de carne y leche en 12 estados de México para detectar la presencia de anticuerpos contra IBR, BVD, BRSV y PI3 por el método de ELISA. El porcentaje de animales seropositivos en forma global fué de 54.91%

positivos a IBR, 55.99% a BVD, 66.38% a BRSV y 73.12% a PI3. De acuerdo al tipo de especialización, en ganado de carne los resultados obtenidos fueron: 54.94% positivos a IBR, 54.18% a BVD, 63.59% a BRSV y 71.33% a PI3. En ganado de leche la seroprevalencia obtenida fué de 54.73% positivos a IBR, 64.81% positivos a BVD, 78.70% a BRSV y 72.10% a PI3. El 84.61% de los hatos muestreados (44) tuvieron anticuerpos contra los 4 virus simultáneamente, 9.61% (5 hatos) reaccionaron contra 3 virus, 2 hatos (3.8%) fueron positivos a 2 virus, y un hato o el 1.9% tuvo anticuerpos contra 1 virus únicamente. No hubo hatos completamente seronegativos

### Acknowledgment

The authors wish to thank Dr. Victor S. Cortese from SmithKline Beecham Health, Technical Services for the review of this article..

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