Prevalence of acute viral diseases in cattle at standard slaughterhouses in East Azerbaijan Province, Northwest Iran 2013

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ABSTRACT

Exact observation and elimination of viral contamination at slaughterhouses is crucial to the livestock industry all around the world due to the possible agricultural and economical disasters which can be caused by a further unnoticed outbreak. Appropriate strategies can be adopted to prevent such outbreaks. This study exhibits the prevalence of acute virological diseases in cattle at three standardslaughterhouses in east Azerbaijan. A total of 273 beef male Holstein Friesians were evaluated within nearly 3 months of investigation from June to September 2013. There are no satisfying means to prevent the spread of BVD-MD or MCF so far but eradicating infected cows seems to be the most effective way.

KEY WORDS: acute viral diseases, slaughterhouses, cattle

INTRODUCTION

The basis of a multi-billion dollar industry worldwide is cattle and they provide about half of the world's meat. (Jason Clay, 2004; Rickard, G., and I. Book, 1999) Settled communities domesticated cattle and pigs not long after 7000 BC. Of the four basic farm animals, cattle represent the most significant development in village life. (ZEUNER, F.E., 1963; Clutton-Brock, J. 1981; Gascoigne, 2001) It is obvious that contaminations and diseases of herds such as cattle can cause great problems even today. 2001 United Kingdom foot and mouth outbreak is a good example of this matter. This outbreak caused a crisis in British agriculture and tourism with nearly 2,000 cases of the disease in farms across most of the British countryside which resulted in killing of over 10 million sheep and cattle in order to stop the disease successfully. Cumbria alone as the worst affected area of
the country reported 843 cases of the diseased. By October 2001, the epizootic was halted and the crisis was estimated to have cost the United Kingdom $16bn. (DEFRA, 2001; ESDS, 2001)

Respiratory diseases such as BVD-MD in cattle are major concern in cattle industry and the main reason for economic losses in both beef and dairy production. (Shirvani, E., et al., 2012; Shiraz University, 2009; Oguzhan Avci, et al., 2014) BVDV is considered as worldwide, complicated and economically significant infections associated with a range of clinical syndromes in cattle. BVDV is endemic in the most cattle raising countries which are characterized by respiratory, digestive tract or reproductive problems. Serologic surveys in the northwest have detected BVD-MD antibodies in 60 to 90 percent of the cattle population, indicating a widespread subclinical infection caused by the virus. (Baker, 1987) In vaccinated herds, calves are usually born free of BVD-MD antibodies and receive antibodies from the colostrum at first suckling. These antibodies survive a relatively short time and reach undetectable levels by 3 to 8 months. After this time, unvaccinated calves are susceptible to infection from BVD-MD. Research has shown that BVD-MD infection causes immune suppression that may cause infected animals to become highly susceptible to secondary diseases, especially pneumonia.

BVDV is of the Flaviridae family and the genus Pestivirus. Noncytopathic and cytopathic are the two biotypes of this virus. The NCP type is the most common which cause persistent congenital infection of the fetus. The CP type is usually associated with mucosal disease. BVD is a viral infectious disease of cattle and other ruminants manifested by an active erosive stomatitis, gastroenteritis and diarrhea. Indirect contact with feedstuffs or fomites contaminated with urine, nasal and oral secretions or faces and contact with aborted fetuses and also direct contact with clinically sick or carrier animals are transmission ways for BVDV. Transmission through aerosol droplet dispersion or by insect vector may also be a possibility. Virus may persist in recovered and chronically ill cattle which are considered a potential source of infection. (Radosits et al., 2008; Herenda, D., 1994; Clell, V., 1997) There is no program for control and eradication of BVDV in dairy herds in Iran thus it is necessary to cull the animals with persistent infection and to prevent BVDV new entry. (Shiraz University 2009).

MCF is an acute fatal lymph proliferative viral disease of cattle, deer, bison and buffalo characterized by inflammation of mucous membranes of the nose, eyes, corneal opacity, profuse nasal discharge and enlargement of lymph nodes and it is not communicable to man. Transmission is possible through close contact between cattle and wildebeest (gnu, antelope), by common use of drinking troughs or by direct contact between cattle and newborn wildebeest and placenta of parturient dams. Disease outbreaks in cattle are usually sporadic with low morbidity rate and high mortality. In American or European MCF, cattle are infected from sheep by Ovine Herpes Virus 2 (OvHV-2) which cause in apparent infection in their reservoir hosts (sheep with OvHV-2 and wildebeest with AlHV-1) but are usually fatal in cattle and other ungulates. The similarity of MCF clinical signs to other enteric diseases, for example blue tongue, mucosal disease and foot and mouth make laboratory diagnosis of MCF important. There are no vaccines for MCF due to cell tropism switching of the virus. (O'Toole, D., H. Li, 2014; Schultheiss, P.C., et al., 2000; Bexiga, R., et al., 2007).

Diagnosis and Necropsy:

A total of 273 beef male Holstein Friesians with no persistently infection were closely observed for nearly 3 months of investigation at three different slaughterhouses in East Azerbaijan Province, Mianeh. The slaughterhouses were isolated and generally standard with no history of outbreaks making it very difficult for disease agents to infect the herd. All efforts were put to work to see whether current methods of herding are satisfying or not. Even the vaccination of BVD was not applied to prevent from consequent diseases. All received calves were evaluated in this duration closely in order to prevent further outbreaks. Bulls suspected of any contamination were separated from the herd, then diagnosed and culled. Contaminations were recorded from the start of the investigation and disease was determined and confirmed by necropsy. During this time of observation from June to September 2013, BVD-MD and MCF acute cases reached statistical significance. Other acute diseases which were not statistically significant were ignored. Ante mortem observations of BVDV suggest that the incubation time for this virus is about 1 – 3 days. The infected animal will suffer from fever, cough, polypnea and salivation, dehydration and debilitation, cessation of rumination, laminitis and obvious congestion and erosions in the mucous membranes of the oral cavity. After culling and necropsy, erosions on the nostrils, mouth, pharynx, larynx, rumen and erythema of the mucosa with sub mucosal hemorrhage in the small intestine, caecum and colon was evident.

In case of MCF, the incubation time is about 9 – 44 days. General increase in body temperature, dyspnea and cyanosis, reluctance to swallow, distinct corneal opacity and blindness, swollen reddened eyelids and bilateral ocular and nasal discharges, enlargement of lymph nodes and erosions on the lips and tongue are the main symptoms. Necropsy showed “Tiger striping” in the distal colon and Intestinal edema, Crater like erosions of the nose, mouth, esophagus and gastrointestinal tract and white areas in the kidneys which are clear signs of MCF. (Kahrs, R.F., 2001) In all cases of MCF corneal opacity and sometimes associated photophobia was evident.
Conclusion:

After evaluations and observations based on diagnosis and necropsy, six cases of BVD-MD and three cases of MCF was reported. None of which showed a meaningful pattern of spread and thus no useful information of how the disease agents infected the herd in the first place was given. There is no satisfying procedure to halt the spread of viral diseases such as BVD. Even the vaccination seems to trigger the disease or worsen it in some cases and so it is not advisable. As we know there is no vaccination developed for MCF. In both of the cases, eradicating the infected animal and separating it from the rest of the herd and culling seems to be the only reasonable way. Keeping the herd away from sheep and goats which are the host animals is one of the necessities. Common and joint Trough is also a reason of infection so keeping the watering isolated as much as possible could prevent the outbreak. Also Cattle should be kept away from places with history of contamination. Unfortunately, lack of accurate information make it somehow impossible to keep track of the disease agents and to keep this kind of contaminations away even from the standard slaughterhouses. Regional difference in prevalence exists due to the variation in the herd population size and management.

REFERENCES

Clutton-Brock, J. 1981. Domesticated animals from early times.
Economic and Social Data Service (ESDS), 2001. Health and Social Consequences of the Foot and Mouth Disease Epidemic.
Iranian Journal of Veterinary Research, Shiraz University, 10(1): 26, 2009.