

A Survey of Bovine Practitioners to Determine Factors Associated with Acute Bloat Syndrome in Pre-Weaned Dairy Heifers

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Introduction

Acute bloat syndrome (ABS) -also known as abomasal bloat syndrome; perhaps better termed acute forestomach dilatation syndrome- is an emerging problem in dairy calves. The disease syndrome affects young calves that are generally healthy prior to the onset of clinical signs and is characterized by abdominal distension and death within 6 to 24 hours. Some calves will apparently respond to therapy if they receive immediate and aggressive intervention, although it is not clear that clinical improvement is necessarily a result of the therapy. ABS has been identified primarily in well managed herds but that may simply reflect a tendency for managers of those herds to be more aggressive at pursuing the problem diagnostically. Many herds have had calf losses due to ABS. In order to further clarify the syndrome and in hopes of identifying promising avenues for further research, members of the American Association of Bovine Practitioners were asked about their experience with ABS.

Materials and Methods

In October 2004 a questionnaire was mailed to 2312 members of the American Association of Bovine Practitioners who listed their AABP activity code as 10 (Dairy), 14 (Mostly Large Animal), or 15 (50/50 Large Animal/Companion Animal). A reminder postcard was mailed 8 weeks later and another survey was mailed in February 2005 to those practitioners who had not yet responded. The response rate was 30.6% with 708 surveys returned. Of those respondents, 276 (39%) had seen at least one case of ABS and it is these surveys upon which the results are based. Practitioners were asked both general questions regarding their experience with ABS as well as questions regarding the last case of ABS that they had seen.

Results

Regarding questions directed at practitioners recollection of all cases of ABS seen in the preceding 12 months, there were no clear trends in the occurrence of ABS with regard to herd size, breed predilection, or season. During the 12 months preceding the survey, respondents reported seeing a median of 4 cases on a

median of 3 dairy operations. Of the respondents, 34% reported that the abomasum was the primary organ involved in most cases, 6.6% reported that the rumen was the primary organ involved, and 21.1% reported that both the abomasum and rumen were involved. Thus the abomasum was at least partially involved in over half of cases and the rumen was involved in over a fourth of cases. Regarding the occurrence of cases upon individual farms 51.1% of respondents reported that cases were sporadic, 11.4% had seen at least one outbreak (3 or more cases on the same farm clustered in time), and 6.5% had seen more than one outbreak; 31% of respondents had seen 2 or fewer cases and so thus could not comment. The age of onset of clinical signs tended to be between 4 and 21 days of age with very few cases <4 days and some cases occurring >21 days of age. The fraction of respondents that reported specific bacteria isolated from samples submitted to a diagnostic laboratory for necropsy or microbiological culture included *Clostridia spp.*: 26.2%, *Sarcinia spp.*: 5.2%, other bacteria: 3%, *Clostridia spp* and *Sarcinia spp.*: 3%, and *Clostridia spp* and some other bacteria: 2.1%. No bacteria were isolated or reported by the lab in 60.5% of cases submitted to a diagnostic laboratory.

Regarding the last individual case that the practitioner had seen, there were again no clear trends regarding herd size or breed predilection. In contrast to the responses regarding seasonality of cases seen in the past 12 months (no seasonality), responses to the question regarding the last case seen revealed a preponderance of cases in the fall ($p=0.0087$ with 23.8% in winter, 20.3% in spring, 21.9% in summer, and 34.0% in fall). However, since the surveys were mailed in the fall / winter it is not unreasonable that the last case seen would have been in the fall. Thus the apparent seasonal difference may be spurious. Results for the clinical signs observed by the practitioner in the last case seen are summarized in Table 1. Common clinical findings included abdominal distension observed on both sides of the calf, fluid slosh upon succussion, colic, and dehydration. Affected calves tended neither to have diarrhea nor fever.

Seventy-three different treatments were mentioned as having been used on the last case. Those mentioned most commonly included antibiotics (25.8% of responses - primarily penicillin and ampicillin), rumen "tonics" (12.6% of responses)- included a wide variety

Table 1. Clinical findings in the last case of ABS seen by the practitioner.

Sign	% of cases where reported
Abdominal distension, left	22.2
Abdominal distension, right	7.1
Abdominal distension, both	65.8
Temperature <100.2 F	26.3
Temperature, 100.3-102.5 F	32.7
Temperature, >102.5 F	4.9
Diarrhea, mild	19.6
Diarrhea, moderate or severe	3.7
Fluid slosh upon succussion	56.4
Recumbency	33.1
Opisthotonus	3.4
Dehydrated	42.1
Sunken eyes	39.5
Colic	47.0

of medicaments), anti-inflammatories (11.6% of responses - primarily flunixin meglumine), attempting to relieve the distension via tube or trocar (10.1% of responses), *Clostridial* antitoxin (8.8% of responses), and fluid therapy (8.6% of responses - primarily intravenous fluid therapy). Of the last cases that practitioners had seen, 60.3% died.

Regarding the farms where the last clinical case had been seen, 62.2% of practitioners rated the overall management practices to be very good or excellent; 88.5% of practitioners rated the overall management practices on these farms to be good, very good, or excellent. Cases of ABS were seen on farms that fed conventional milk replacers, "accelerated growth" milk replacers, fresh pasteurized milk, fresh unpasteurized milk, pasteurized milk from treated cows, and unpasteurized milk from treated cows. Milk was fed from bottles, buckets, and multiple nipple gang feeders. No single diet type or feeding method emerged as being a conspicuous risk factor for ABS. It must be noted, however, that it would have been difficult to have detected such a factor from our data since we did not have data from farms that did not have a case of ABS to which to compare our results. Nevertheless, based upon the limited published information regarding calf feeding practices and upon the authors' knowledge of typical calf feeding practices, diet constitution and method of feeding on farms that had had a case of ABS reasonably reflected the diet constitution and method of feeding on dairy farms in the USA. Likewise, frequency of feeding, type of calf-starter feed, access to hay, presence of

antibiotics or coccidiostats in the milk replacer, and type of calf housing on the farms that had had a case of ABS seemed to reflect typical management practices in the USA.

64 different preventive treatments or strategies were mentioned by practitioners as being, in their opinion, effective at preventing ABS. Those mentioned included (in decreasing order of the frequency of the response) Anti-*clostridial* specific treatment (*Clostridial* toxoids, pre-treatment with *Clostridial* antitoxin, autogenous *Clostridial* vaccination), "There is no effective preventive strategy", general sanitation, consistency in temperature of the milk or milk replacer / consistency in feeding time intervals / consistency in milk replacer mixing, and switching to milk replacer from milk or vice versa.

Significance

While isolation of *Clostridia spp.* from clinical cases in no way proves that *Clostridia spp.* are the causative agents of ABS, the frequency with which these organisms were isolated deserves to be noted. *Sarcinia spp.* were the second most common bacterial isolate. *Sarcinia spp.* have been associated with an abomasal bloat type syndrome in goat kids (DeBey *et al* 1996). Further research to clarify the role of *Clostridia spp.* and *Sarcinia spp.* in the pathogenesis of ABS is needed.

Notwithstanding that management was rated as good to excellent on most farms where a case had been seen, various improvements in calf management practices (e.g. consistency in feeding time intervals) were cited as being effective at preventing future cases. This underscores the idea that attention to detail cannot be overstated regarding calf management practices.

Acknowledgements

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Reference

DeBey BM, Blanchard PC, and Durfee PT: Abomasal bloat associated with *Sarcinia*-like bacteria in goat kids. JAVMA Vol. 209 No. 8, October 15 1996: 1468-1469.

Special Note

This study was previously presented as an abstract only at the American Dairy Science Association meeting.