ABSTRACT: A unique law (Act 201) requiring livestock markets to place an identifying mark on calves up to 90 kg each time they are sold went into effect in Wisconsin in 1993. The intent of the law is to reduce the number of times calves are resold and hence become “stale.” The original proponents of the law proposed that calves be ear-notched each time they are sold. Ear notching, however, was resisted by Wisconsin regulatory agencies partly because of fear of an adverse public reaction. These authors then conducted a study to determine the approximate amount of discomfort experienced by young Holstein calves during ear notching. Six 2-mo-old Holstein calves were used to determine heart rate and behavioral responses to a standard “V” pig ear notcher (6 mm wide × 14 mm deep) applied between the tip and halfway down the dorsal edge of the left ear. Five other calves were given 30 s of access to a rubber nipple to provide a comparison to a desirable stimulus. Ear notching only elicited a mild startle response that lasted 1 to 2 s followed by resumption of normal behavior. The calves presented with the nipple suckled or butted the nipple for the full 30 s. The mean heart rate for the 30-s period in which treatments occurred was 95 ± 4.8 bpm and 110 ± 5.8 bpm for the notched and suckled calves, respectively, and was not influenced by treatments (P = .50). The momentary discomfort experienced by the calves during notching seems to be negligible compared with the possible benefits of reducing the number of times calves are resold. Although these results were presented at hearings on the “rules” that would be adopted in Wisconsin to implement the Stale Calf Legislation, the decision was made to use only glue-on back tags to track calves. The law has lost credibility and the support of even its original sponsors, the Wisconsin vealers, because of the ease with which glued-on tags can be altered. Because this well-intended legislation is inefficacious under the present rules, the law is likely to be repealed if the rules are not modified.

Key Words: Calves, Ears, Identification, Pain, Veal, Animal Welfare

The Issue

The repeated selling of very young dairy calves is a long-standing problem for veal producers and others who raise dairy calves purchased on the open market in the United States. An analysis of Beef Check-Off program data found that the average Wisconsin calf is sold 2.34 times before its arrival at its final destination, generally a veal farm (J. Dietrich, personal communication). One contributing factor is the practice, followed by some farmers, of immediately taking newly purchased sickly or otherwise undesirable calves back to market to be resold, often to another veal farmer.

At the urging of veal raisers, the 1992 Wisconsin Legislature approved the first law in the United States (Act 201) mandating that calves up to 90 kg be marked each time they are sold. The intent of the law is to reduce the number of times calves are resold and hence become “stale.”

The Wisconsin Veal Growers Association recommended that calves be marked with an ear notch each time they are sold, fearful that glued-on tags could be easily taken off (Fyksen, 1993a). Wisconsin Department of Agriculture officials resisted ear notching on the grounds that it would enrage animal rights activists and be prohibitively costly and time-consuming to the markets (Metke, 1993). They were also against ear notching because a notch, as opposed to a unique number, would not provide a record of who owned the calf (Fyksen, 1993a). The Wisconsin Independent Livestock Dealers Association was opposed to all forms of special identification of calves, including ear notching and hair clipping (Fyksen,
feeding situation as a positive control. The calf dealers were also against tracking multiple calf sales (Fyksen, 1993b). This opened the livestock dealers to charges of "multiple sales mean multiple commissions" (Metke, 1993).

Public hearings were held by the Wisconsin Department of Agriculture in 1993 prior to the establishment of the final rules for the "Stale Calf" legislation. The present study was conducted to provide objective information regarding the relative amount of pain or discomfort a calf experiences during ear notching by measuring behavior and heart rate. It was the authors' intent that such data would be presented at the public hearings and would facilitate a reasonable resolution of the ear notching controversy. However, the reception afforded this relatively simple study, combined with the evolution of this issue in Wisconsin, provide a fresh perspective for animal scientists regarding this and related current issues.

The Study

Materials and Methods

Eleven 2-mo-old Holstein calves were randomly assigned to one of two treatments. Six calves had their left ear notched using a standard v-cut ear notcher (6 mm wide, 14 mm deep) applied between the tip and halfway down the dorsal edge of the left ear. Five calves were given 30-s access to a nipple bottle to provide a comparison to a stimulus that would be considered desirable. Thus, each calf was used as its own control and notching was compared to a normal feeding situation as a positive control.

The calves were housed in the same individual indoor bedded pens (1.5 m x 1.5 m) in which they had been raised. One to two weeks before this study the calves had been weaned from milk, but they still reacted strongly to the sight of a nipple bottle.

One day before application of the treatments, two 4-0 stainless steel sutures, one on the sternum and one on the ribs, immediately behind the shoulder, were inserted through the skin and loosely tied, leaving a 1-cm loop. The calves seem to react to the suturing as they would a normal hypodermic injection with a relatively fine needle. After a momentary startle response, the calves remained calm while the suture was tied.

Before administration of the treatments, two people entered each calf's pen and attached an electrode lead using alligator clips to each stainless steel suture. One of the people then exited the pen while the other, who would administer the treatment, remained motionless while standing toward one side of the pen. A battery-powered transmitter telemetrically relayed the heart beats to a receiver controlled by a microcomputer, which recorded each beat and tabulated a per-minute heart rate using a modification of Datacol (Stuart and Friend, 1989). The calf's heart rate was then monitored until it was stable (within a 5-bpm range) over three 30-s samples, after which three 30-s basal heart rate samples were recorded. At the start of the fourth 30-s sample, the calf was either ear-notched by the person or the person presented the calf with a handheld nipple for 30-s. The actual time ear notching occurred during the 30-s sample varied slightly because it could take several seconds for a calf to assume a position that would allow an accurate notch. Each calf's ear was only loosely held. Heart rate was then recorded for two additional 30-s periods while the person continued to stand quietly in the pen. The transmitter and sutures were then removed from the calf and the next calf was attached to the telemetry equipment and sampled. The order of administration of the treatments alternated.

The behavior of each calf was closely observed and its activity before and after the application of the treatments was recorded. One of the objectives was to determine the duration of the disruption that occurred to each calf's behavior as a result of the treatments, and to record any occurrences of ear twitching, shaking, or other signs of discomfort.

Data were subjected to analysis of covariance with repeated measures (SAS, 1985). Treatment, sample number, and their interaction were main factors and the three basal heart rate samples were covariates.

Results

Ear-notching elicited a mild startle response that proved to be too short to time accurately. Three calves jerked their head away and then immediately returned to eating their hay or grain. One calf that was lying during notching stood up but remained still until proceeding to smell items in the pen. The other two calves focused their attention on the person in the pen, one of these two then vigorously attempted to play with the person. There were no occurrences of ear twitching, ear shaking, or other signs of discomfort.

No attempt was made to quantify bleeding because of possible interference with the behavior of the calves; however, bleeding seemed to be limited to 1 to 3 mL. Informal observation found no signs of infections or swelling for the next 5 d, after which the calves were sold.

Of the calves presented with a nipple, all but one immediately started to suckle the nipple and continued to do so through the 30 s period. That calf did not start to vigorously suckle the nipple until approximately 10 s had transpired. Upon removal of the nipple, the calves rapidly settled down except for one calf that made several attempts at nursing the person who held the nipple.
Mean heart rates for each of the 30-s periods (Figure 1) were not influenced by treatments \((P = .50)\). The mean heart rates for the notched calves and the suckled calves during the 30-s period in which notching occurred were 95 ± 4.8 and 110 ± 5.8 bpm, respectively. Because the reactions to ear notching were of much shorter duration than 30 s, and the suckled calves were active during the entire 30-s period, we would expect the means for the 30-s period to be higher for the suckled calves. The data from the suckled calves, however, are still useful as a basis for comparison as this established values that described activity in response to a positive stimulus.

Figure 2 shows the calculated heart rate per beat for each of the calves during ear notching. The Datacol computer program measured the time between each pulse or heart beat. The extreme variation that occasionally occurred from one sample to the next was probably the result of extraneous electrical potentials triggering the transmitter. However, the general trends that can be seen in Figure 2 are an accurate representation. The calf represented by the juxtaposed triangles that had the greatest sustained heart rate was the calf that attempted to play with the researcher immediately after ear notching until the end of the 30-s period. Because of that calf's relatively high heart rate, that calf had the greatest number of heart rate samples \((40)\) during the 30-s sample. Elevated heart rates have been associated with greater pain sensations (Pratt, 1980; Morton and Griffiths, 1985). However, heart rate can also greatly increase during pleasurable situations, making the context within which an increase occurs very important. The arrows indicate the heart rate immediately before ear notching for the two calves that showed a marked increase in heart rate immediately after ear notching.

Because of the increased amount of physical movement that occurred in the suckled calves, there was more artifact and hence, more missing data. Means of

Figure 1. Mean heart rate for each 30-s sample for the ear-notched and suckled calves. “Trt” indicates the 30-s sample during which the calves were either ear-notched or sucked a nipple.

Figure 2. Individual heart rates calculated for each set of impulses received by the Datacol computer program for the ear-notched calves. Arrows “A” and “B” indicate the heart rate reading taken immediately prior to ear notching for the calves represented by — and +, respectively.
that data, however, are still relatively accurate representations of what happened during the 30-s period.

Discussion

At the January 12 meeting of the Wisconsin Department of Agriculture, Trade and Consumer Protection Board, held in Madison, a summary of the results of the above study was presented. A video tape of the administration of the treatments to several subjects and their subsequent reaction was also shown. The Board, however, elected to use only back tags, and not ear notching. The office of Wisconsin’s Secretary of Agriculture defended the Board for not approving the ear-notching method on grounds that if it were approved the next day’s headlines might be: “Wisconsin Department of Agriculture endorses mutilation of calves’ ears” (Dietrich, 1993). We, however, have not been able to find any evidence of individuals or established animal welfare groups criticizing or planning to criticize the ear-notching requirement. This may be largely due to the welfare enhancing properties of the “stale calf” legislation.

Ear notching, however, has not previously been used in this application or on the scale necessary to determine whether it would be an effective deterrent to reselling calves. Similarly, there are no data available on infection, swelling, or other complications that may be experienced by young calves that are ear-notched under sale barn conditions. We expect complications to be less than that experienced when calves are ear-tagged, however, because there would not be a tag penetrating the wound that keeps the wound irritated and open for a longer period of time.

Many vealers believe there is little compliance with this version of the law and have withdrawn their support (T. Seubert, personal communication). The livestock markets, against any regulation from the start, claim that the program is too much of a burden. Bills were introduced in the spring of 1993 in the Wisconsin Senate and Assembly to repeal the “stale calf” Act 201 (Dietrich, 1993; Sanstadt, 1993). As of February, 1994, the “stale calf” legislation had not yet been repealed, but it was no longer enforced and was largely ignored by the livestock dealers (J. Dietrich, personal communication).

Implications

The U.S. livestock industry needs examples of producers sponsoring legislation that improves the welfare of livestock and documents the industry’s capability to police itself. The Wisconsin Veal Growers succeeded in obtaining the legislation they had requested requiring that calves be identified each time they are sold. The research reported in this article found that the veal grower’s preferred method of marking the calves (ear-notching) was essentially painless. The rules established to implement the legislation, however, required only glued-on back tags as the only method of identification, partly due to concern over the public’s reaction to requiring ear notching. Unfortunately, the ease with which the glued-on back tags can be altered has led to increasing inefficacy and a general lack of support for the legislation, even by its original sponsors. The decrease in support by the vealers and continuing strong opposition from the livestock markets may soon result in its repeal or a revision of the rules that implement the legislation. This current issue illustrates the difficulty of bringing diverse parties together to produce efficacious animal welfare legislation and that scientific evidence can often be ignored in favor of other considerations.

Literature Cited