A Grazing Recorder Harness for Use with Zebu Type Cattle

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Highlight: *The hump, dewlap, and neck-curve of Zebu (Bos-indicus) cattle make it difficult to fit a stable harness which involves a neck-band. A harness design is described here which allows a vibracorder automatic grazing recorder to be correctly and securely positioned on the neck of these cattle. It has proved suitable for use with range-herded animals.*

Various automatic devices for recording grazing time and/or the pattern of grazing have been described in recent years (Canaway et al., 1955; Young, 1966; O'Shea, 1969; Stobbs and Cowper, 1972). The most successful of these is the vibracorder developed originally for logging vehicle operating times and therefore readily available commercially. It was first used on sheep (Alden, 1962; Arnold and Bush, 1963) and has subsequently been fitted to Jersey dairy cattle (Stobbs, 1970).

The vibracorder contains a pendulum that is free to oscillate on one plane, within limits imposed by stops. When mounted vertically it transmits motion to an attached stylus which marks a wax coated, clock-work driven chart. Two models of vibracorder are available, daily and weekly. The daily is most suitable for animals easy to handle and the weekly for those which have to be restrained for examination (e.g., wildlife species).

The instrument is most sensitive when its long axis is vertical and least sensitive when horizontal. In order to record grazing times, therefore, it is necessary to place the recorder so that it is upright when the head of the animal is in the grazing position, and out of the vertical when the animal is not grazing. This necessitates mounting it on the side of the neck sufficiently forward to insure a positive change in attitude when grazing commences, and yet sufficiently far back that it does not interfere with food selection and eating action.

Stobbs (1970) positioned the vibracorder by means of a metal plate fitted to a canvas belt fastened around the neck; the instrument was prevented

from slipping by being tied to a halter and counter-balanced with weights. This method is not suitable for Zebu type cattle because the large dewlap and neck folds prevent the neck-band from being tightened sufficiently. Humped cattle walk with their necks in a seemingly more curved position (Fig. 1) than do Shorthorn and other

humpless breeds. This leads to an accumulation of skin folds in the neck region, which prevents any neck-band from being securely fastened when the head is raised. When the animal is grazing with the head down, the skin unfolds (Fig. 2) resulting in a reduction in effective neck diameter, causing a neck-band to become ex-

Fig. 1. *The grazing recorder in the nonsensitive position when the animal is walking. Note the curve of the neck, the skin folds, and the loose pouch-girth connector straps.*

Fig. 2. *The vibracorder tilted forward into the maximum sensitivity position. Note the elimination of the neck skin folds, and the tight pouch-girth connector straps.*

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cessively loose (Fig. 3). If the neck-band is tightened when the neck is in the extended position, the animal is upset by the resultant neck constriction when it tries to return to the head-up, walking posture. Further, the Stobbs (1970) method of attaching the vibracorder to the harness is not suitable for range-herded cattle as it does not afford the instrument sufficient protection against possible impact damage from other herd animals and from encounters with substantial woody vegetation.

It was decided, therefore, to design a vibracorder harness that did not depend on a halter and neck-band for positioning and which afforded reasonable protection to the instrument. The harness described here is easily fitted and adjusted, holds the vibracorder in the correct position at all times, and does not disturb the animal when it is feeding. The harness consists of three units (Fig. 4), a neck-band and two halves of an adjustable girth. It has been extensively field tested during experimental work at the Kiboko Range Research Station, Kenya, and found very satisfactory.

The neck-band is a canvas pouch (22 x 21 x 8 cm) sewn to a broad 18-gauge piece of canvas (68 x 12 cm) which is positioned on the left side of the animal's neck (Figs. 1 and 4). The canvas curves round the dorsal and ventral parts of the neck but does not completely cover its right side. The ends of the canvas are joined by a narrow (3 cm) adjustable webbing belt so that the right side of the neck is exposed, thus reducing heat irritation. The neck-band is fitted to the animal when it is in the head-up position so that it is firm but not tight, with the minimum necessary compression of the dewlap.

The two halves of the soft, 6 cm wide, double belting girth run behind the forelegs and the hump, respectively, being joined by adjustable straps on each side. It is important that the upper half-girth is centered so that the two right-hand buckles are equally spaced on either side of the spine (Fig. 4). Similarly, the lower half-girth must also be centered. The variable side straps allow the girth to be fitted to any sized cattle without disturbing the essential center positioning.

From the upper part of each side of the neck-band, a strap runs back and is fastened to the lowest buckle on the same side of the upper half-girth (Fig. 2) passing on either side of the hump. Similarly, a strap runs back from the neck-band to the lower half-girth passing on either side of the sternum. Another strap runs diagonally from just beneath the pouch and fastens to

the top left buckle of the upper half-girth. It is this strap which prevents the neck-band from rotating and moving forward, thus ensuring that there is a change in attitude of the pouch when grazing starts. When fitting the two upper pouch-girth connector straps, it is important that the animal be in the head-down position so that their correct length can be determined; too short and they restrict feeding, too long and they let the neck-band slide forward when the animal is grazing. When it is in the nonfeeding walking posture these straps hang loosely (Fig. 1) while the pouch is carried horizontally. During feeding the pouch is tilted towards the animal's head, thus providing the

necessary change in attitude of the recording instrument (Fig. 2).

The recorder is encased in a 7.5 cm thick block of polystyrene foam cut in half parallel to the broad face with each half hollow sculpted to the shape of the recorder. The block thus firmly holds the vibracorder in the neck-band pouch in such a way that when the pouch is tilted forward the instrument comes into the maximum sensitivity position, and when it is horizontal the vibracorder is angled back (about 45°) to a nonsensitive position in which the pendulum rests on one of its stops. A sheet of 4-mm hardboard is inserted in the pouch between the block and the outer pouch wall; this serves to distribute impact shocks over the

Fig. 3. When grazing the effective diameter of the neck decreases so that the neck-band becomes very loose. It would slide forward and swing out of position were it not for the pouch-girth connector straps.

Fig. 4. Details of the grazing recorder harness; the parts are arranged as if the head of the animal were on the left. Measurements are in centimeters. (A) Neck-band with vibracorder pouch; (B) Upper half-girth; and (C) Lower half-girth.

whole block and reduces damage due to piercing.

The animals quickly become adjusted to the harness (total weight, including vibracorder, is 2 kg) and the charts can be changed in the field. At the Kiboko Range Research Station, Sahiwal steers have worn the harness continuously for periods of up to 30 days (except for the twice weekly dip) without ill effect.

Reports of the experimental work involving the vibracorders will be published later.

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