

INTRODUCTION

It was originally intended to work on the rate of passage of feeding stuff through the alimentary tract of ruminants using a fistulated bovine for the purpose. The operation of fistulation however was not a success; due to a misunderstanding of the instructions the fistula was made excessively large so that the cannula did not fit properly and the wound constantly leaked. Contrary to all expectations the cow calved and this, together with the constantly leaking wound led to a general emaciation of the cow. It was decided that in its present state the cow was of no further service so it was slaughtered. It is hoped that another bovine may be fistulated probably within a year. With this in mind it has been considered advisable to include in this thesis a review of the literature on fistulation to provide a basis for future work using fistulated bovines.

[The use of fistulation is not a new technique. The first record of a fistula comes from Canada where in 1822 a young French Canadian, who had been badly wounded by gunshot, had an operation performed on him which resulted in a fistula. R.W. Dougherty (1955). Unfortunately the report does not describe the means used to close the fistula but present day techniques used for closing fistulae will be described in subsequent chapters.

A fistula may be described simply as an artificial opening made into the alimentary tract of an animal as a result of an operation and for the purpose of examining the contents either visually or by sample of that particular part of the alimentary tract. Fistulae are commonly made into the rumen but they may be made into any part of the alimentary tract; for example, fistulae have been recorded in the

abomasum, duodenum and oesophagus. These latter fistulae are always of the closed or cannula type using either plastic or rubber cannulas.

It has been pointed out that fistulae can be established in any part of the alimentary tract and in ruminants varying in age from a few days to maturity. The life expectancy of these animals is not impaired and in general, if healthy animals are used and if they have good care there is no reason why they should not be considered to be normal for all practical purposes. W. Burrows et al. (1946) describing an experiment to measure the rate of passage of foodstuffs through the rumen said "The question of the influence of a rumen fistula upon normal function of the organ cannot be answered definitely. It is however believed to be inconsequential in most respects provided the opening is properly closed with a well fitted plug which prevents leakage of ingesta and at the same time is not irritating to the surrounding tissue of the animal. A comparison of the gains made in liveweight and the general appearance of the fistulated cattle used in this experiment with those of cattle without fistulae which were used in a parallel experiment give support to this assumption". That quotation also supports R.W. Dougherty (1955) who says that fistulated animals should always be considered to be normal healthy animals. Another example to support this is seen in an experiment carried out by C.C. Balch et al. (1955) on the secretion of milk low in fat content by cows on diets low in hay and high in concentrates. In this experiment which lasted 27 weeks two Shorthorn cows were used, each was fitted with a large rumen fistula. One cow calved 32 days before the experiment and was fistulated a week after the start of the experiment. The other cow calved 17 days before the start of the experiment and had

been fistulated for over two years. Further it appears to make no difference what sex of animal is fistulated. Ya A. Sergeer (1952) studying the digestion of different types of rations used a fistulated bull throughout the period of the experiment during which time the bull was used for natural service. (1) An open fistula is the term applied to a rela-

tively Hence we see that a fistula in no way detracts from the natural health of an animal nor interferes with its natural functions. However the post operative period seems to be comparatively dangerous. It is during this time that infection may enter the unhealed wound. In this connection good management especially in the tropics, is necessary for fistulated animals. Included in good management is the actual technique of fistulation and closing it properly as well as general husbandry. Care should be taken to ensure that fistulated animals are not overcrowded. If they are to be kept indoors then it is advisable to keep them in separate stalls, or if pens are to be used, then where possible keep one cow per pen. This eliminates the tendency especially in cows to chew each others cannula and bung.

The design and material used for the cannula and bung are very important and great advances have been made in this line in the last few years. G.C. Balch (1951) describes a pneumatic cannula and bung for ruminants in cattle. It is constructed entirely of rubber and when in position the whole appliance is highly flexible and very light, weighing only 1.3 lbs. In addition it does not cause any discomfort during manipulation within the alimentary tract. The cannula consists of two circular flanges, one which is inserted into the