

MEAT RESEARCH NEWS LETTER

CSIRO

NUMBER 69/9

MEAT RESEARCH LABORATORY

DATE 29th October, 1969

P.O. BOX 12. (CNR. CREEK AND WYNNUM ROADS). CANNON HILL. BRISBANE. QLD 4170 TELEPHONE 95 4006 TELEGRAMS FOODPRES BRISBANE

ECCHYMOSIS OR BLOOD SPLASH

Ecchymosis, or blood splash, is an escape of red blood cells from blood vessels into the surrounding muscle. The haemorrhage may result from rupture of blood vessels, usually very small ones (capillaries), or sometimes from leakage of red blood cells through small holes in imperfect blood vessels. In fresh meat the haemorrhages appear as dark red spots usually not more than $\frac{1}{2}$ " in diameter.

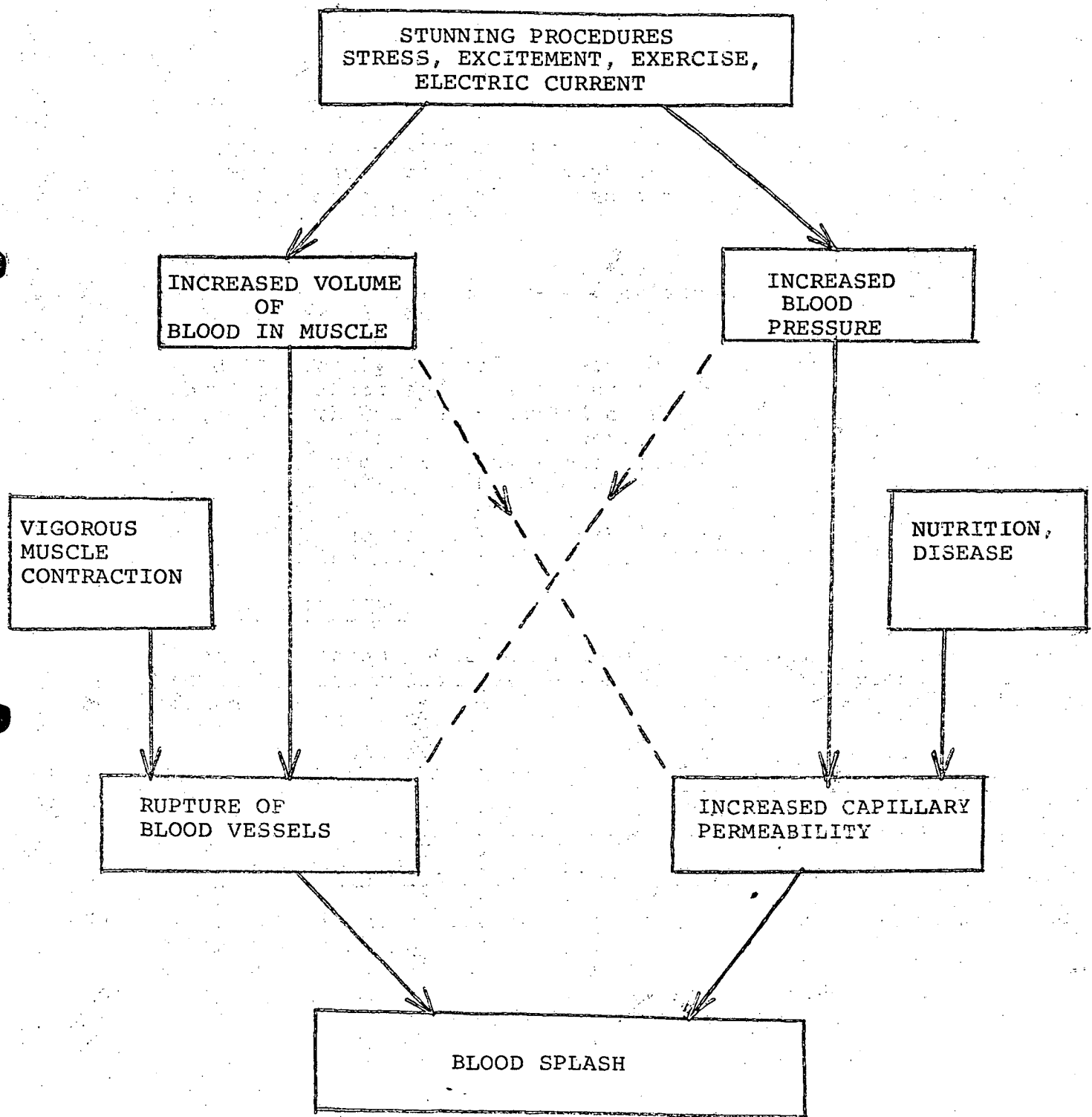
CAUSES OF ECCHYMOSIS:

The exact cause of ecchymosis is not known but it involves high pressures in the vessels, or weak blood vessels, or a combination of the two.

Preslaughter excitement and stresses lead to a general increase in blood pressure in the larger blood vessels and an increase in the amount of blood in the smaller vessels. At stunning, the blood pressure and heart rate increase. It is probable that rupture of the distended smaller blood vessels is caused by vigorous muscular contractions and struggling which occur after stunning.

Some diseases may weaken the vessel walls and result in an increased occurrence of haemorrhages.

FACTORS WHICH MAY BE INVOLVED IN THE PRODUCTION OF "BLOOD SPLASH"



Climatic conditions appear to influence the incidence of the disorder. There is evidence that ecchymosis is more prevalent in the northern areas of Australia, but it is not confined to warmer areas. In one study, it was found that the incidence increased as mean daily temperatures increased. At certain times, particularly in the northern areas of Australia, up to 25% of cattle forequarters have been affected sufficiently to be downgraded.

OCCURRENCE:

Ecchymosis occurs throughout the world in cattle, sheep and pigs that are stunned prior to slaughter. It may occur in animals which have been bled without stunning but there is no documented evidence on this.

Almost any muscle can be affected. In cattle, the muscles of the forequarter are more severely affected than those of the hind, and ecchymosis is frequently seen in the diaphragm.

In electrically stunned animals, up to 66% of lamb hearts have shown some blood splashes and up to 20% of sheep hearts. The proportion of lamb hearts condemned because of this disorder may be up to 5%. The maximum incidence of affected hearts is usually found in the first few weeks after installation of the electrical stunning apparatus. However, even after works personnel have become used to methods of operation, the percentage of hearts showing at least one blood splash may average as high as 20%, with up to 2% being sufficiently affected to be condemned.

WHY IS ECCHYMOSIS IMPORTANT:

Economic losses result from meat being downgraded. Occasionally, the extent of blood splash may be sufficient for the product to be condemned.

Meat with blood splashes is unattractive in appearance. The splashes are particularly obvious in cured products.

PREVENTION:

- (i) Animals that are "knocked" before bleeding:
 - (a) It is important that animals should not be excited or stressed before stunning.
 - (b) Bleeding should be carried out as soon as possible after stunning. Animals should be bled in turn and not left in groups, unbled, after stunning.

- (c) In cattle, effective "pithing" (i.e. complete cutting of the spinal cord immediately after stunning) reduces the disorder to a very low incidence.
- (ii) Animals that are electrically stunned:
- (a) Animals should not be allowed to remain in the restraining race for long periods, and should be stunned at an even rate.
- (b) The lowest voltage found to give satisfactory stunning should be used, particularly for lambs and other young animals.

The voltage and the time of application needed for young animals is less than that needed for older animals. Voltage and time settings are also affected by factors such as the length of the fleece, amount of moisture on the skin or hide in contact with the electrodes, and the type of machine in use.

- (c) The points of the electrodes should be kept clean and sharpened regularly.
- (d) The animals should be bled immediately after stunning. There is evidence that, with pigs, the interval between stunning and bleeding should not exceed five seconds.

FURTHER INFORMATION REQUIRED:

Any industry information relating to the incidence or occurrence of ecchymosis and any results of tests concerning ecchymosis, would be very useful to this Laboratory.

---ooo0000ooo---

NEWS JOTTINGS:

During October, we were visited by the fifteen members of the Australian Meat Industry Study Group from Japan.

Next issue will be Dark Cutting Beef.