

stainless steel. Except in the case of very large defects or in adult animals where the repair is subjected to great stress, a single layer of stainless steel mesh is adequate. Limited personal experience with the more flexible polypropylene mesh indicates that it may be preferable to use two layers routinely because of the more immediate physical support they provide. Polypropylene is of particular value in cases where there is a peritoneal defect. Johnson has shown experimentally that (3, 4, 5) provided it is laid carefully under even tension to eliminate wrinkles, only minimal adhesions develop and these cause no untoward effects.

The lack of tissue reaction to these materials even in the presence of infection is significant because infection may already be present from previous attempts at repair of a hernia or closure of a laparotomy incision. Whenever possible the infection should be overcome prior to repair of the hernia but this is occasionally difficult because excision of the infected tissue entails further weakening of the abdominal wall at the site. In such cases, therefore, it is necessary to insert the prosthetic material at the

same time as performing the debridement. Although abscessation may follow, experience has shown that this can be overcome by the use of antibiotics and local drainage without having to remove the mesh.

#### References

1. Hamilton, D. P., Nelson, D. R., and Hardenbrook, H. J. (1974). Repair of Ventral Abdominal Hernia in a Horse, using Tantalum Mesh. *J.A.V.M.A.*, 164, 1204-1205. - 2. Heinz, C. D., Bullar, J. F., and Johnson, L. E. (1972). *Eq. Med. and Surg.*, 2nd Ed., Am. Vet. pub., 858. - 3. Johnson, J. H. (1967). Surgical Implantation of Polypropylene Mesh in the Abdominal Wall of the Equine Species. *Proc. Am. Assoc., Equ. Pract.*, 13, 333-339. - 4. Johnson, J. H. (1969). An evaluation of Polypropylene implants in Ponies. *J.A.V.M.A.*, 154, 779-785. - 5. Johnson J. H. (1969). Use of Polypropylene Mesh as a Prosthetic Material for Abdominal Hernias in Horses. *J.A.V.M.A.*, 155, 1589-1594. - 6. Numans, S. R., and Wintzer, H. J. (1964). Zur Alloplastik in der Hernienbehandlung bei grossen Haustieren' *Wien Tierarztl Monatschr.*, 51, 433-440. - 7. Stapp, R. W. (1960). Repair of Umbilical Hernias with Plastic Screen. *Mod. Vet. Pract.*, 41, 60. - 8. Whitcomb, O. W. (1955). Tantalum Mesh in the Repair of Recurrent Abdominal Hernias of Horses and Cattle. *Iowa State Coll. Vet.*, 17, 143-144. - 9. Wintzer, H. J. (1962). Methods for Surgical Treatment of Bovine Abdominal Hernias. *J.A.V.M.A.*, 141, 131-134. - 10. Wion, J. E. (1957). A New Technique for Hernial Repair in Large Animals. *J.A.V.M.A.*, 131, 56-58.

## Udder Surgery

**G. Espersen**

*Institute of Surgery  
the Royal Veterinary and Agricultural University  
1870 Copenhagen, Denmark*

The treatment of mastitis and lesions of the teats encompasses about 40 per cent of the daily work of a practitioner in a dairy-cattle district in Denmark. Treatment of teats after contusions, teat wounds, teat stricture and stenosis encompasses only 10 per cent of his daily work and 30 per cent is related to mastitis. It is well known that consultations are more frequent in districts with small livestock where the reduction of the milkyield from a single cow is of more economic importance than it is for large livestock. An indication of the importance of teat stricture (stenosis) is the production of instruments. A single Danish company produces five million bourgies per year. About one million are used in Denmark and the remainder are exported to Northern Europe, Canada, Australia and New Zealand.

The published experiences concerning teat-diseases come mainly from practitioners in Switzerland, but also from those in the Netherlands, Denmark and other countries breeding dairy cattle. At international meetings, teat diseases are normally not discussed and this is the reason for this short report.

The surgical treatment of teat diseases is very often related to the supply of instruments on the market. A survey of the instrument catalogues shows that a sur-

prising number of old-fashioned instruments are still on the market and must be sold and used. Consequently, it will be necessary to make some remarks about the instruments which have to be used by Danish practitioners in the treatment of traumatic teat diseases.

Practically all dairy cattle are now dehorned to prevent traumatic injuries of the udder and teats. Barbed wire around fields is now replaced with electric wire and in this way big lesions and wounds have been reduced. Farmers no longer breed cattle with huge teats which were important in the handmilking days. Cattle with especially big udders and big teats in the first weeks after calving will be treated preventively against traumatic lesions by the wellknown Dutch udder bag. Many traumatic diseases will therefore be contusions as a result of trampling with or without wounds and the strictures in the teat canals will normally have some relation to the permanent high vacuum in the milking machine.

Practitioners normally use Rompun anaesthesia, since they have the impression that local injection of anaesthetic gives more trouble and pain for the animal. Simple wounds are normally sutured by agraffes (clamps) placed close to each other. These methods are also used for small penetrating wounds combined with a teat canula. The surgical technique for large penetrating wounds is normally the following: to be free of the permanent stream of milk, a teat tube is inserted and the practitioner uses an Esmark's sling around the base of the teat. The wound is closed with interrupted sutures using an

atraumatic needle with catgut. Sometimes horizontal mattress sutures are used. Complicated sutures are never used by practitioners. The result is that all penetrating wounds are treated with plastic teat tubes because, compared to the complicated wound suturing practitioners prefer the loss of milk to acute mastitis. There is no pressure of milk upon the suture and therefore no tension to give a milk fistula. Universal preventive treatment with antibiotics gives a permanent flow of antibiotics through the udder gland during the days when the mastitis risk is highest. This method reduces the number of cases of acute mastitis resulting from wounds compounded by original sub-clinical or slightly chronic mastitis. In such cases, local treatment with antibiotics in the lower part of the udder would never reach a sub-clinical process in the upper part. Contusion of the teat can be total, but often only the distal part is affected. Practitioners use two methods. Sometimes they treat with only intramammary antibiotics, perhaps by direct injection in the chamber at the base of the teat. After the acute inflammation has subsided they treat the complications. In other cases, the practitioners use a plastic tube and treat universally with antibiotics. There exists on the market a very long teat drain, with a soft extension for cases of contusion of the whole teat where edemas have closed the teat chamber.

Complications of traumatic injuries render cattle with membranes, small epithelium processes, granulations in the cistern and stenosis in the teat canal, hard milkers.

Distal membranes situated in the cistern give a better prognosis than proximal membranes; therefore these will normally not be treated. After disinfection of the distal pocket, the practitioner uses the Finnish "cork-screw" instrument, the Danish perforator (Haug) or the papillomatom (Knudsen). Again the standard procedure involves a plastic tube and universal antibiotics during the early days. It is well known that an animal can suddenly become wild and often be accidentally wounded by the instrument. The perforator and papillomatom are therefore formed in such a way that the instruments immediately close themselves when they are out of the surgeon's hand.

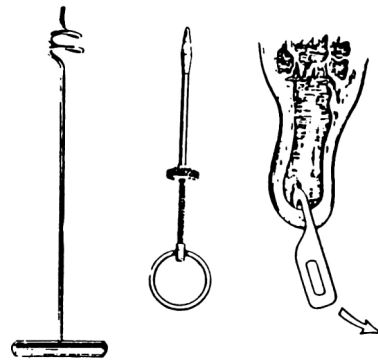
Hard milkers or cases of obstruction of the teat-canal are treated by surgery. Practitioners use only a teat knife with one edge. The most recommended knife is the Dyekjaer model. The weight of this knife is a few grams. If the animal gives trouble, the knife will hang on the teat and will not fall off when the surgeon removes his fingers. The incision will always be made in the upper part of the teat-canal and only one wound has to be made. This technique avoids the risk of mastitis.

After the incision, bourgies are used. This can be done with or without antibiotics and prevents the wound from closing just after the incision. A new bourgie will be used after every milking.

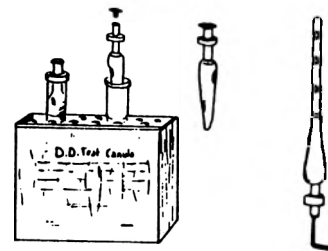
*Incontinentia lactis* after wounds is still a problem. Injections of a few ml Lugol's solution into the tissue with a tuberculin syringe and intradermal canula to produce a cicatrice does not normally give good results. The same can be said about suturing a permanent ligature of catgut around the opening. The method of infusion of chemical solutions (Lugol's solution, glycerol-alcohol 1:1 or silver nitrate, 3%) to dry such a gland very often gives a bad reaction. The general method is therefore injections of antibiotics and closing the canal.

Amputation of teats is a very simple procedure used against chronic mastitis with massive production of pus and intoxication of the animal. However, the permanent flow of pus contaminates the surrounding tissue creating infections, and we have as yet no means of stopping the flow in a short time.

Amputation of the udder can be performed in cases of necrotic mastitis or chronic suppurative mastitis but, in general, this is a very difficult procedure. Our experience is based first of all on cases of necrotic mastitis. This disease begins as a very severe acute mastitis and is treated as such in practice. Within the first 12-24 hours the necrosis reaches its full extent. At this stage, the animal will normally be in a state of toxic shock. We treat the shock with heavy doses of antibiotics, corticosteroids and 3-5 litres of blood. In several cases we have seen severely depressed animals recover after this blood-transfusion, but still about 20 per cent of the cases died within the first 2-3 days.



Teat instruments generally used by Danish practitioners. "Cork screw" instrument, papillomatom (Knudsen), "D-D" teat knife (Dyekjaer).



Teat-tube and drain. Plastic-tube with plug. Plastic drain with soft extension ("D-D", Dyekjaer). From catalogues: P. Pedersen Ltd., GUELPH, Canada and MECA VIGOR, Paris.

After a week the demarcation begins and it is our experience that the amputation has to be carried out between the stages of shock and demarcation. If done later, the procedure becomes very complicated. It is easier to enucleate a hanging udder than an udder with a big base; the easiest cases are those with emphysemas and large edemas. First the A. and V. pudendalis ext. should be double ligated. The artery is found at the base of the udder between the fore- and hind-quarter covered by lateral fascia. A vertical incision (15 cm long) has to be made and the pulsating artery is found by feeling. It is not difficult to isolate the two big vessels with a finger. Secondly, the veins (V. Subcut. abdom. and perineal vein) are doubly ligated on both sides, so as to limit the loss of blood. The teats should be ligated and with, a circular incision around the teats and necrotic area, the amputation begins with a dissection all the way round. The dissection at the base of the udder should

be done with great care, avoiding cutting into the infected gland and too deeply into the abdominal wall. The skin should be sutured by interrupted sutures; to prevent pockets under the skin the sutures must be attached to the abdominal wall. Loss of blood and changes in the fluid balance should be compensated for during the operation. Shock is the main risk during this operation.

During 10 years we have operated on 38 cases and of those 11 cases died during or just after, the operation. The recovery period takes about 1½ months. In 133 cases we have used the conservative method with spontaneous demarcation and wound healing takes about two months. 20 per cent of these cases died. The prognosis is better, but the necrotic demarcation gives off a horrible stench. Our present experiments are therefore to find a way to shorten the time of demarcation and wound healing.

## Abstracts

### Bovine Surgery - 1976. J. L. Noordsy.

A review of literature citations concerning bovine surgery for the years 1970 through 1976 is cited and elaborated on as to specific areas of interest.

Citations emphasize the areas of reproductive, gastro-intestinal, locomotor and mammary systems as well as the field of anesthesia.

Continued interest in these areas is projected by reviewing the papers to be presented at the 9th International Congress on Diseases of Cattle.

An example of surgical research in 1976 is the bilateral paravertebral alcohol block of S-4 and S-5 spinal nerves as a control for rectal tenesmus.

The bovine species is cited for its importance in the world food production.

### Anaesthesia in the Bovine Using Halothane as Inducing and Maintenance Drug. J. van Niekerk.

The results using Halothane as a sole drug in the anaesthesia of the bovine show a favourable cost structure when compared with other methods of anaesthesia and also indicate that this method is extremely safe with a very low mortality rate.

### Use of Ketamine in the General Anaesthesia of Cattle. G. Pezzoli and M. del Bue.

Ketamine, a "dissociative drug", has been used in the general anaesthesia of cattle. The dose employed for induction was 5 mg/kg body weight given by i/v injection in more than one minute. Anaesthesia was maintained by a drip infusion of 5% glucose solution, containing 3 mg/ml Ketamine. This solution was given at a rate of 90/120 drops/min. The treated animals showed deep analgesia, good muscular relaxation, with loss of consciousness without hypnosis. All reflexes were retained and ruminal regurgitation was absent. When the drip infusion of Ketamine was stopped, the animals emerged from anaesthesia and were back on their feet 10-30 minutes later. The cardiovascular and respiratory systems were not markedly influenced. Neither during the induction nor the recovery phase was excitation observed.

### The Value of Pyloromyotomy and Omentopexy in the Surgical Treatment of Right-sided Abomasal Displacement and Torsion in Cattle. M. A. van der Velden.

Based on the experiences gained in 86 cases of surgical treatment of right-sided abomasal displacement and torsion of the

abomasum, the value of the pyloromyotomy and the omentopexy is discussed. The author concludes that pyloromyotomy has a beneficial effect on the prognosis of surgery, while the combination of omentopexy and pyloromyotomy gives the most satisfactory results.

Experimental studies of the long-term effects of pyloromyotomy have been carried out on nine goats.

### Cecal Volvulus in Dairy Cattle. R. H. Whitlock.

Cecal volvulus in dairy cattle results in a variable degree of anorexia, abdominal pain, decreased milk production and decreased fecal output. In a review of over 60 cases at the New York State College of Veterinary Medicine, a gas filled viscus was detected in the right flank by simultaneous auscultation-percussion in all cases except one. During rectal examination either the blind tip of the cecum or the distended colon could be palpated. Clinical pathologically most of the cows had a compensated hypokalemic, hypochloremic, metabolic alkalosis. Intravenous potassium-rich fluids were used to treat the patients with severe dehydration. Surgical correction by laparotomy and draining the cecum was very successful. Occasionally the gangrenous cecum had to be amputated with anastomosis of the ileum to the colon (8 of 60 cases). About 10% of the cases recurred, often about one year later. The overall prognosis for life and return to milk production is very good in cases of cecal volvulus in dairy cattle.

### Surgical Repair of Spiral and Ventral Penile Deviations of the Beef Bull. J. L. Noordsy.

A surgical procedure for correction of a spiral deviation of the bull is described. It is a modification of the technique described by Walker (1964). Emphasis is centered on re-inforcing the dorsal ligament, shortening the dorsal ligament to a slight degree and establishing firm adhesions between the ligament and the tunica albuginea to prevent rotation.

A similar technique is utilized for treatment of the ventral deviation along with added emphasis on shortening the dorsal ligament.

### Surgical Treatment of Urine Drinkers in Young Bovine Production Units. M. Lefevre, J. M. Chanet and J. M. Garrau.

Calves showing signs of loss of weight and appetite on farms where they are fed out of buckets are not urine drinkers, as is too often thought; they are animals suffering from testicles damaged by the other animals. Both prophylaxis and medical treatment are possible through epididymectomy or by attaching clips.

#### Hip Dysplasia in Cattle. A. D. Weaver.

Hip dysplasia occurs in the Hereford, Aberdeen Angus, Galloway and Charolais breeds of cattle. The clinical features are described. Pathological lesions are found in both hip joints, and an initial shallowness of the acetabulum and superficial degenerative cartilaginous changes are succeeded by development of a secondary osteoarthritis as joint instability increases. Hip dysplasia is inherited, probably as a recessive. Penetrance is higher in the male. The role of anatomical factors such as shaft-neck angle and the degree of anteversion of the femur, as well as mineral analysis of bone of affected cattle have been investigated.

The Hereford Breed Society has a control scheme based on pathological examination of individuals. All Charolais cattle are screened for hip dysplasia by veterinary clinical examination in quarantine.

#### Surgical Correction for Upward Fixation of the Patella. C. L. Boyd.

The relationship between poor conformation and upward fixation of the patella is well recognized. Most of these cases can be considered as a congenital predisposition. There are some cases that are acquired due to trauma which results in myositis or fibrotic myopathy.

The common procedure for correction of upward fixation in the equine is medial patella desmotomy. This procedure has been applied in the bovine with disappointing results in most cases. Resection of the crural fascia in conjunction with the patellar desmotomy has also given disappointing results.

Anatomy of the stifle joint and the patella are reviewed. The opposing force of pull exerted through the tendons inserted on the patella are rationalized. The balance is achieved by transecting the tendon of the vastus medialis muscle and the medial patellar ligament. This procedure has been employed in eight surgical procedures.

The surgical technique and the anesthesia employed are described. This technique developed by the author has been in use for four years and the author has substantiated the results over this time period.

#### Radical Surgery (Amputation) or Conservative Treatment (Drainage) in Cases of Septic Pedal Arthritis and Navicular Bursitis in Cattle. H. W. Merrens.

An observation was carried out with regard to forty-nine cows, which had been treated for a purulent necrotizing arthritis as a complication of a rear leg.

In seventeen cases the pedal joint was drained by means of track made by an electric fraise. In sixteen cases the claw was amputated under the coronet and in the remaining sixteen cases the claw was sawn off above the coronet, through the second phalanx.

It emerged that from the seventeen drainage-cases nine patients were retained for several lactation-periods. Thirty out of the thirty-two cows where a claw-amputation had been performed, were slaughtered within one year. If a cow is not to be retained for several years after treatment, a simple amputation above the coronet is to be recommended.

#### A Report of an Outbreak of Encephalic Malformation in Calves. L.M. Markson, C.E. Winkler and S. Terlecki.

During a period of 11 days, four calves with malformation of the brain were born of a group of Friesian heifers, sired by one bull. Clinical abnormalities were ataxia in varying degree, abnormal carriage of the head and, in one case, muscular tremor. Three of the calves had cerebral cavitation varying from porencephaly (two calves) to hydranencephaly (one calf). All four calves had severe cerebellar dysplasia. Virological and immunological results strongly suggest an aetiological relationship with bovine viral diarrhoea-mucosal disease virus.

#### Non-infectious Pathology Peculiar to Industrially Reared Young Cattle. S. Ghergiu and E. Onet.

The authors review the most frequently encountered nutritional and metabolic diseases in industrially reared calves and young beef cattle. They mention nutritional alopecia of calves, necrosis of the cerebral cortex (NCC), cumulative copper toxicosis, tetany and spasmophilia.

With young beef cattle the most common diseases are ruminal acidosis, ruminitis and the subsequent suppurative hepatitis, NCC, copper toxicosis, urolithiasis and locomotive disturbances.

Taking into consideration the data available in the literature, as also the authors' own observations concerning the aetiology of these diseases, prophylactic recommendations are made underlining the interrelationships between some of these entities. Reference is also made to the behavioural disorders encountered and their prevention.

#### Left Dislocation of the Abomasum in the Calf as Pathology During the Weaning Period. R. Cheli and C. M. Mortellaro.

The authors point to a new clinical form which appears in both young beef calves intended for fattening and those intended for reproduction. The symptomatology points very strongly to chronic tympanitis but a careful clinical examination reveals specific signs of left dislocation of the abomasum, comparable to that appearing in adult cattle. Once a diagnosis has been made, only surgery can effect a complete cure and it is generally a successful operation.

#### *Mycoplasma Dispar* and Pneumonia in Calves. E. M. Allan, H. M. Pirie and I. E. Selman.

Mycoplasmas are considered important in the aetiology of the calf pneumonia complex. In order to investigate this further, groups of calves ranging from one month old to six months old were examined for pneumonia and the presence of mycoplasma. *Mycoplasma dispar*, *Ureaplasma* spp., *Mycoplasma bovirhinis* and *Acholeplasma laidlawii* were isolated from some calves. *Mycoplasma dispar* was only found in older calves with pneumonia; this pneumonia was usually characterized by peribronchiolar lymphocytic accumulations with or without an associated alveolitis or alveolar collapse.

In addition, the results of observations on the lungs of these animals using electron microscopy, which also detected the presence of mycoplasmas, are described.

#### Application of 0.5% Novocain Blockage in Acute Pneumonia of Calves. Elisa Aznar and G. Korschevenco.

A study on the therapeutic efficacy of the blockage with 0.5% Novocain in the stellate ganglion of 50 calves affected with acute pneumonia was conducted.

The variations in the post-treatment clinical symptoms were assessed, and the correlation between the frequency of applications and the recovery of the animals was studied.

The results obtained evidence the efficacy of the blockage in acute pneumopathies.

#### Etiology and Pathogenesis of Abomasal Bleeding in the Netherlands. H. J. Breukink.

Yearly losses due to abomasal ulceration and haemorrhage in the Netherlands range between 2000 and 3000 head of cattle, mostly high yielding cows. Bleeding occurs during the summer when the cows are on pasture. Most ulcers are located along the greater curvature.

It is shown that the incidence of abomasal bleeding is related to the rainfall, the stocking rate of the farm, the amount of fertilizer used and the type of pasture. The lactation yield of the affected cows had been considerably higher than that of others of the same age maintained under comparable circumstances. The possibility that geo-sediment plays a role in the etiology is considered. The higher incidence of abomasal bleeding in certain areas is shown.

It is suggested that the composition of the grass grown under favourable circumstances may hold certain factors that cause persistent mucosal damage in the abomasum.

#### The Principles and Philosophy of the Compton Metabolic Profile Test. J. M. Payne.

The objective of this test is to assess whether or not the blood chemistry within a dairy herd is normal or abnormal and the principle behind the test rests on the fact that differences between herds are associated with most of the variation in blood chemistry in dairy cows. Also important to a lesser degree are factors

associated with differences between groups of cows giving various amounts of milk. For these reasons the test is carried out on three groups of seven cows which are either at peak yield, late in lactation or dry at the time of the test, and on a herd basis.

Background work was necessary to validate full interpretation. Firstly: accurate assessments had to be made of analytical error and quality control of all blood determinations. Secondly, a thorough knowledge had to be gained of "normal" standards and their confidence limits. Thirdly, a decision had to be made on limits of "quality" which would be acceptable, both from statistical and clinical points of view. A practical application of the test in two surveys has shown that a large number of herds can be classified as abnormal and that this links various clinical problems. In many cases preventive medicine is successful in eliminating the difficulty. Examples will be quoted of the way the test is used in practice and the action to be taken as a result.

#### A Continuous Metabolic Profile of Grazing Dairy Cattle Over a One Year Period. M. Merrall.

In New Zealand the feeding of dairy cattle is by the continuous grazing of pasture over the whole year, with comparatively little hand feeding being practised as in Europe. Therefore it was considered that the marked fluctuations in both quality and quantity of feed, over which the farmer has little control, may affect a metabolic profile more profoundly than in countries where hand feeding is extensively practised.

In this study individual animals were monitored in four herds at regular four-weekly periods over the year. The sampling was designed to give information on the nature and extent of physiological changes which could be attributed to current nutrition, season, state of lactation, pregnancy, and age of the animal.

Changes were detected in some of the parameters measured. These included haemoglobin levels, PCV, plasma urea, serum calcium, serum sodium, serum inorganic phosphate, plasma glucose, total serum protein and serum albumin levels. No significant changes were detected in serum magnesium and serum potassium. In some cases the levels of metabolites varied randomly. This variation cannot be explained at present.

It is considered that the measurement of metabolic profiles, while still in the experimental stage, holds considerable promise as a guide to the suitability of the available feed in dairy cattle.

#### Metabolic Profile Test of Ruminal Fluid and its Application in the Diagnosis of Rumen Dysfunctions, B. Hofirek, P. Jagos and R. Dvora.

The metabolic profile test of ruminal fluid, besides being a sensitive evaluation, is based on biochemical examinations yielding information on the level of rumen fermentation processes. When selecting biochemical examinations the ultimate goal was to intercept final metabolic products of basic nutritive materials in the ruminal fluid. To interpret the metabolic profile test, the following criteria were considered: pH, total acidity, lactic acid level, concentration of fatty acids both total and proportional, ammonia concentration, reduction activity and ciliate protozoan number. The method of ruminal fluid sampling, the most suitable time for sample taking, the methods of examination of individual biochemical criteria, and the possibilities of sample conservation for further examination were all established.

Both the overall and individual results of the test were found to be sufficiently discriminative in detecting the difference in composition of feed rations when changing from one type of feeding to another. The test proved useful in diagnoses of acute and chronic rumen dysfunctions most frequently encountered in practice, their diagnosis frequently being difficult.

#### Grass Tetany: A New Pathogenic Hypothesis. P. Larvor and Y. Rayssiguier.

Grass tetany is a metabolic disease in cattle which is distinguished biochemically by hypomagnesaemia and hypocalcaemia.

Hypocalcaemia results directly from a lowering of plasmatic magnesium. Hypomagnesaemia modifies the calcium exchanges in the bone, lessens the response of the bone to parathormone and vitamin D and leads to a blockage in the secretion of parathor-

mone.

Hypomagnesaemia cannot result solely from a lack of magnesium in young grass or a lessening of the digestibility of magnesium, but may result from a change in magnesium transfers between the various parts of the organism. In experiments, we have reproduced such modifications in magnesium exchanges. The perfusion of adrenalin or theophylline induces fierce hypomagnesaemia together with an increase in the mobilization of lipids. Lipolysis is accompanied by the accumulation of magnesium by the adipose cell membranes. Cold or lack of food have the same effect with regard to hypomagnesaemia by an increase in lipolysis. It is possible to prevent hypomagnesaemia by treating the animals with an antilipolytic agent.

These results enable a new etiopathogenic picture of grass tetany to be advanced.

#### Amyloidosis of the Liver in Cattle. S. Stamatovic, D. Sofrenovic and G. Matic.

Differing degrees of amyloidosis were diagnosed after macroscopic and histological examination of 41 cows suffering from chronic, suppurative processes on the lower limbs, mastitis and endometritis and accompanied by hepatomegalia and cachexia in 75.6% of the cases. Kidney amyloidosis had not been established in any of the investigated cases. Amyloidosis of the liver was followed by hyperproteinaemia, hypoalbuminaemia, hyperglobulinaemia, binding of the gamma and beta globulin fractions and, frequently, hyperbilirubinaemia.

#### The Development of Annual Herd Health Programmes for Beef Cattle Breeding Herds. I. M. Gunn and D. C. Blood

A planned herd health and management recording programme has been developed for beef cattle breeding herds in southern Australia. The programme has been developed around the annual breeding cycle of the herd and forms the basis of three planned veterinary visits pre-calving, pre-joining and post-joining, along with a detailed recording and analysis service to improve total production performance.



*A Votre Santé*  
**See You**  
**in Mexico City**  
**in 1978**