

VIII International Conference on Cattle Diseases September 9-13, 1974 - Milan, Italy

Over 300 veterinarians and their wives, along with several guest speakers, from 23 countries attended the VIII International Conference on Cattle Diseases in Milan, Italy, on September 9-13, 1974. The Congress was held in conjunction with the VI Congress of the Italian Buiatrics Association.

Dr. Harold E. Amstutz, president of the World Association for Buiatrics, presided over the opening ceremony on Monday morning, September 9. The guest speaker was Dr. V. Colombo, Minister of Health, Rome.

Numerous papers were presented on mycoplasmosis, metabolic and reproductive diseases.

Social highlights of the Congress were an evening at the ballet in La Scala Theatre, the glittering banquet and a visit to the Zooprophyllactic Institute for Lombardy and Emilia, and the Lake at Garda.

Dr. Eric Williams presented a report to the Board of Directors on the progress of *The Bovine Practitioner* as a communication link between the various national Buiatrics Associations.

The AABP was represented by Dr. L. Mac Cropsey, president; Dr. Harold Amstutz, executive secretary-treasurer; and Dr. John Noordsy, district 7 director, who also presented a paper (see page 38). The Congress was under the direction of Prof. Dr. E. Seren, Milan, and Dr. G. Vacirca, local secretary.

At the Annual General Meeting, the British Cattle Veterinary Association, the Latin American Buiatrics Association, the French Buiatrics Association, and the Australian Cattle Veterinary Association were admitted to membership of the World Association.

Summaries of Some Papers Presented at the VIII Congress

Symposium on Mycoplasmosis

Classification and Identification of Bovine Mycoplasmas

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Cholesterol dependence, which is the basis of the subdivision of *Mycoplasmatales* into *Mycoplasmataceae* and *Acholeplasmataceae* may be determined indirectly by means of digitonin, as *Mycoplasmataceae* is sensitive to this compound, while *Acholeplasmataceae* is resistant.

Species classification is based mainly on serology, and double immunodiffusion and metabolic inhibition supplemented with growth inhibition are the methods of choice. It is evident, though, that a serologic classification implies that a given species or subspecies may include different biochemical variants. The following mycoplasma species or subspecies of bovine origin have been recognized: *M. bovoculi*, *M. dispar*, *M. bovirhinis*, *M. mycoides* subsp. *mycoides*, *M. bovirhinis*, *M. agalactiae* subsp. *bovis*, *M. arginini*, *M. alkalescens*, *M. gallinarum*, *M. gateae*, *A. laidlawii*, *A. modicum*, *A. axanthum* and *A. bactoclasticum*. Two "serogroups," group 7 of Leach and group L of Al-Aubaidi and Fabricant, have been well studied, but not finally classified. These two groups are very much related to each other and to *M. mycoides*, but further investigations, including nucleic acid hybridization, are necessary before a final classification can be made. Work has also to be performed in regard to bovine T-mycoplasmas, which have recently been assigned to the genus *Ureaplasma*; this genus comprises all T-mycoplasmas. The generic name refers to the unique capacity of the members of this genus to catabolize urea.

In the routine diagnosis and identification of bovine mycoplasmas the sensitivity to digitonin and presence of urease should be

tested in order to distinguish between *Mycoplasma*, *Acholeplasma* and *Ureaplasma*. In the genus *Mycoplasma* the amount of serological work may be reduced according to the results of the following four tests: catabolism of glucose and arginine, phosphatase activity and serum digestion. In the genus *Acholeplasma* it is recommended to test every isolate against antisera covering all *Acholeplasma* species, as very little is known about biochemical variations of acholeplasmas. The classification of T-mycoplasmas is not, with the exception of human strains, sufficiently elaborated to allow species or serotype identifications. Within all three genera the final serologic inhibition and immunofluorescence are highly valuable because of the simplicity and specificity. If either one of these tests is positive, the isolate may be regarded as identified. The immunofluorescence test is the most sensitive method, but cases are also seen where growth inhibition is positive only.

Table 1

Taxonomy of Bovine Mycoplasmas

Class: Mollicutes
Order: Mycoplasmatales
Families: 1. Mycoplasmataceae
Genera: <i>Mycoplasma</i> and <i>Ureaplasma</i>
2. <i>Acholeplasmataceae</i> – Genus: <i>Acholeplasma</i>
Species Classification: Growth inhibition, metabolic inhibition and immunofluorescence.
Demonstration of Interspecies Relationship: Complement fixation or double immunodiffusion.

DNA Hybridization:

Group I - glucose negative and arginine negative strains.

Group II - glucose negative and arginine positive strains.

Group III - glucose positive and arginine negative strains.

Group I: Homologies of 40% between the 2 subspecies of *M. agalactiae*.

Group II: Homologies in the range of 10 to 50%.

Group III: Homologies of 60 - 85%.

A final classification is not advisable until more powerful antisera are available.

Table 2
Bovine Species and Serogroups

Species Designations	Type or Reference Strain	Serogroups of Leach (1967)	Serotypes of Al-Aubaidi & Fabricant (1971)
<i>M. bovoculi</i> (<i>M. oculi</i>)	M165/69		
<i>M. dispar</i>	462/2		
<i>M. bovirhinis</i>	PG43 (SM331)	4	D
<i>M. mycoides</i> subsp. <i>mycoides</i>	PG1	1	A
Not named	PG50 (N29)	7	E
Not named	B144P		L
<i>M. bovigentialium</i>	PG11 (B2)	2	B
<i>M. agalactiae</i> subsp. <i>bovis</i>	Donetta (PG45)	5	F(<i>M. bovi-mastitidis</i>)
<i>M. verecundum</i>	107 (NCTC10145)		
<i>M. arginini</i>	G230		
<i>M. alkalescens</i>	D12 (PG51)	8	G
<i>M. gateae</i>	CS		H
<i>M. gallinarum</i>	PG16 (Fowl)		I
<i>A. laidlawii</i>	PG8 (Sewage 8)	3	C
<i>A. modicum</i>	Squire (PG49)	6	M
<i>A. axanthum</i>	S743		K
<i>A. bactoclasticum</i>	ATCC 27112		

Mycoplasmas from Respiratory and Genital Apparatus of Cattle

Allegri, G., Flammini, C. F., Scatozza, F., Bottarelli, E., Istituto di Malattie Infettive, Profilassi e Polizia Veterinaria Università di Parma, Parma, Italy.

The present report summarizes the results obtained in microbiological investigations carried out with different materials from bovine sources. They may be grouped as follows:

(1) Nasal and tracheal exudate as well as lungs and bronchial lymph nodes from animals showing acute respiratory symptoms.

(2) Utero-vaginal exudate from cows in which genital conditions were observed, represented by the appearance of a whitish, sticky and sometimes purulent discharge. In the farms of origin of these cows a low conception rate and sterility were also observed. Moreover, eight samples of frozen and ready for use bull semen from artificial insemination centers were examined.

(3) Vaginal mucus swabbed from cows in seven herds situated in a limited area of the Piacenza plain and comprising three

neighboring communes. In some of these animals the clinical picture of Granular Vulvo-Vaginitis was detectable, while in others no symptoms or lesions were observed in genital organs. The constant finding was however represented by a high percentage of transient or permanent infertility.

In all cases, microbiological investigations were performed by the methods already reported (Allegri et al., 1971a; 1971b). The obtained results may be summarized as follows.

(1) Mycoplasmas were isolated from the respiratory tract of 7 out of 14 animals belonging to three of the five examined groups. Moreover, in several occasions they represented the only organisms detected in the different samples (tissue suspensions or exudates) in that neither bacterial growth in blood agar plates nor CPE (Cytopathic Effect) in BFK (Bovine Fetal Kidney) cells were observed. In several instances bacterial growth was obtained which was represented by single or mixed species. Two IBR virus strains and one Enterovirus were isolated in BFK cell cultures inoculated with materials from animals of the same groups from which even mycoplasmas were detected. So, the last ones were isolated only in association with viral agents.

(2) With reference to the bull semen, five samples showed the presence of mycoplasmas as the only organisms detectable. They were isolated as well from utero-vaginal discharge taken from one or more cows from all the examined groups. Mycoplasmas were often associated with a different bacterial flora but samples bacteriologically sterile were also encountered. CPE in BFK cells has never been observed but microscopic examination of infected monolayers grown on Leighton tubes and Giemsa stained showed the presence of organisms morphologically identifiable as mycoplasmas and cultivable in acellular media inoculated with tissue culture fluids. So, these strains would have been missed without inoculation of cell cultures.

(3) Blood agar plates showed a different microbial flora represented by single or mixed cultures. However, bacterial growth was not obtained with several swabs plated on blood agar. CPE was never observed in BFK monolayers in which, unlike the preceding groups of animals, in no case the presence of mycoplasmas was detectable either on microscopic examination of stained cells or by plating tissue culture fluids in acellular media. This situation might have been caused by the fact that inoculation of acellular media was carried out immediately after collection of specimens while monolayers were inoculated after the same specimens were stored in a frozen status. Mycoplasmas were isolated from vaginal swabs of animals coming from two out of seven herds studied, particularly from one out of twelve cows in one case and from two out of eight in the other. During this series of investigations, it has been observed that the medium suggested by Goodwin et al. (1967) is more efficient by respect to that of Hayflick (1965) for the isolation of mycoplasmas from bovine genital apparatus.

All isolates grow only in media enriched with horse or swine serum, and they are at present to be identified serologically.

Mycoplasmosis in Beef Cattle Herds

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Epizootological, clinical, microbiological and therapeutic observations on 21 mycoplasmosis outbreaks in Italian beef cattle herds from 1970 to 1973 are reported.

The disease was observed mainly in animals imported from other European countries. Early symptoms were noticed 1-2 weeks after the imported animals entered the herds. Two to three weeks later all animals present were diseased, whence the assumption that cattle present in the herd before the introduction of the imported stocks seem to indicate a carrier role of the imported animals. The characteristics of disease spread, the collection practices in original countries, the lengthy travels, the poor hygiene in many of the Italian farms definitely play an important role in the spread of the disease. Clinical signs are those of a respiratory syndrome with fever and general loss of condition. Joint lesions and sometimes diarrhea are present. Age of imported animals ranged from 2 to 20 weeks and morbidity between 2.8 and 88.6% (average 24.2%). Mortality mean

rate was 7.5%, with a maximum rate of 33.3% among diseased animals. For the whole population the mortality mean rate was 1.8% with peak rates of 20.4%.

The isolation of mycoplasma was not difficult. The synovial fluid aseptically drawn from acutely affected joints resulted in the most suitable specimen for isolating pure strains. The characterization of the isolates carried out with eight reference serotypes, allows one to identify 71 out of the 94 isolates. The most frequently encountered type was *M. agalactiae* var. *bovis* (58.51%) followed by *M. bovigenitalium* (7.46%), *M. arginini* (4.25%) and *M. serotype 8* (1.06%). Antibodies inhibiting the growth of the mycoplasmas were usually present in the sera of the farm animals from which they were isolated.

The sensitivity of the 94 strains to tylosin, spiramycin and erythromycin was determined *in vitro*.

Nearly 90% of the tested strains proved to be sensitive to spiramycin and tylosin at levels lower or equal to 10 mcg/ml. The activity of erythromycin resulted markedly inferior. The mass therapy consisted of spiramycin and tylosin given orally for five to seven consecutive days. 90% of the treated animals recovered clinically.

In summary: (A) Mycoplasmosis prevalence in beef herds in a number of Italian regions is high; (B) Spreading, symptomatology and lesion characteristics agree with other published research; (C) Mass therapy with tylosin and spiramycin proved to be satisfactory; (D) The greatest losses in beef breeds caused by the disease are due more to poor zooeconomical indexes (growth, conversion) observed in diseased animals than to mortality.

Mycoplasma Diseases in Dairy Cattle

Redaelli, G., Ruffo, G., Centro per lo studio della patologia della mammella e la produzione igienica del latte del C.N.R., presso l'Istituto di malattie infettive, profilassi e polizia veterinaria, Università di Milan, Milan, Italy.

After the report that contagious pleuropneumonia must be attributed to *Mycoplasma mycoides*, mycoplasmas have assumed considerable importance in dairy cattle breeding, where it is recognized today that they are responsible for a series of diseases affecting chiefly certain organs and systems.

Diseases of the genital tract. They interfere chiefly at reproductive levels and affect both the external genitalia and the deep-seated portions of the genital tract.

Joint diseases. Reported early in cattle as in other species, they have been found occasionally at our breeding stations in association with foci of mycoplasma matitis.

Udder diseases. Attributable to *M. agalactiae* var. *bovis*, *M. arginini* and, although less frequently, *M. bovigenitalium* and other species as yet not exactly identified, these infections have considerable bearing on the economics of milk production. Their appearance and spread on farms may be related to the peculiar mycoplasma diseases of beef calves, which must often be regarded as the reservoir of these microorganisms. Clinically this disease is fairly well characterized, though it raises some problems of treatment and prevention because of the nature and different morbid possibilities of the various etiological agents.

Diseases of Bovine Reproduction Associated with Mycoplasma Infections

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Members of the *Mycoplasma* group of microorganisms are versatile pathogens and some strains have been recently associated with reproductive disorders in cattle. In female cattle, such genital diseases as vaginitis, cervicitis, endometritis, salpingitis and abortion have been reported to be caused by *Mycoplasma* infections. In addition to these infections that cause reproductive failures, *Mycoplasmas* have been implicated in causing mastitis.

Although isolations of *Mycoplasmas* from the semen and genital organs of bulls have been repeatedly reported, their significance in

causing reproductive disorders in male cattle is still a matter of controversy. However, it is clear that artificial insemination with contaminated semen and bulls with genital *Mycoplasmosis* are means of the spread of infection among cattle.

Mycoplasma Arginini in Vitro Action of Foetal Lung in Calves Morar, R., Faculty of Animal Breeding, Cluj, Romania.

The author worked with strain 76/1969, isolated from the nasal discharge of a calf with bronchopneumonia, typed by the courtesy of Dr. R. H. Leach (Mycoplasma Reference Laboratory, London). Lung and trachea specimens 0.3-0.5 cm³ in size were sampled from a five-month-old foetus, washed in a sterile saline solution, of which eight lung and four tracheal specimens were incubated in tubes containing fluid media (for PPLO), with *Mycoplasma* cultures. Another eight lung and four tracheal specimens were also incubated in a *Mycoplasma* free media (control specimens).

The tubes were kept thermostable for 48 hours, then specimens were fixed in Carnoy, included in paraffin, sectioned and stained with hematoxylin-eosin, Brachet, PAS and Giemsa. After cultures in agar were performed it was stated that control tubes had not been infected and that *Mycoplasma* developed in each "sample."

With lung specimens incubated in *Mycoplasma* media, the disappearance of alveolar endothelium cells alignment was noticed concurrently with ballooning, vacuolisation of nuclei and of endothelial cytoplasm. Feulgen positive round shaped fragments of stroma nuclei were also found. In stroma, minute cocobacilli pool were observed.

Tracheal modifications were not stated. All these modifications were due to *Mycoplasma* or to pH changes of cultured media caused by *Mycoplasma*.

Pharmacokinetics of Antimycoplasma Antibiotics in Dairy Cows and Ewes

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Serum and milk concentrations of tetracycline, dihydrostreptomycin, kanamycin, spectinomycin, tylosin, spiramycin, chloramphenicol and clindamycin were analyzed kinetically in lactating cows and ewes after intravenous and intramuscular injections.

Although the serum concentrations of dihydrostreptomycin, kanamycin, and spectinomycin were higher than those of the other five antibiotics, the former were more quickly eliminated from serum, were estimated to be distributed in the vascular and extravascular spaces only and a small fraction of the administered dose appeared in milk. Concentrations of clindamycin, spiramycin and tylosin which were higher than the accepted minimal antimycoplasma concentrations were maintained in milk during 12 to 56 hours after a single intramuscular injection at a dose level of 20 mg/kg of body weight. It is suggested that the duration of effective antimycoplasma concentrations of antibiotics in milk can serve as a useful indication regarding the duration of effective antibiotic concentrations at body sites commonly affected by mycoplasma infections.

Chemotherapy of Experimental Bovine Mycoplasma Arthritis

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Mycoplasmas were isolated from cases of arthritis in Iowa feeder cattle and identified as *Mycoplasma agalactiae* var. *bovis*. Severe and persistent polyarthritis are produced by intravenous or intra-articular administration of cultures to calves, steers, or cows. After exposure, the organism was recovered from synovial fluids, blood and nasal mucus, but not from urine or feces. *In vitro* growth of the organisms was inhibited by tylosin (0.1 mcg/ml). If applied promptly after exposure, antibiotic therapy delayed the appearance of the clinical signs of mycoplasma arthritis, but treatment with

tylosin (10 mg/kg of body weight per day in two doses for three days) or clindamycin (1 dose of 50 mg by intra-articular injection) did not eradicate *M. agalactiae* var. *bovis* from infected joints or reverse the clinical signs.

Therapeutic Treatment of Two Grave Episodes of Bovine Mycoplasmic Mastitis

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In a large open stable of the Pavese low lands, enclosing 245 Italian Frisone dairy cows, the first episode of mycoplasmic mastitis occurred. With alarming rapidity, 32.14% of the cows either capable or incapable of lactation were struck. Five months after the disappearance of the infection, a high percentage of the cows, which were sporadically cured of the streptococcus mastitis, were struck by staphylococcus mastitis, and a small percentage by mycotic mastitis.

As soon as these morbose forms were cured, the mycoplasmic mastitis reappeared; notwithstanding immediate intervention 14% of the cows were struck.

In both of the dramatic epizootics, the collaboration with the scientific institutes, the exceptional good will of the directors and the abnegation of the milkers, the review of the mechanical milkers, the accurate disinfections and the immediate employ of macolidic antibiotics extended to all cows sick or apparently healthy, either capable or incapable of lactation, permitted the clinical recovery of all the sick cows without any loss.

Bovine Mycoplasmic Mastitis: A Prophylactic Contribution by Vaccination

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The work is concerned to the results of the vaccinal prophylaxis carried out during the winter (1972-73) on six herds infected by mycoplasmic mastitis, including 563 cows, 129 of which were ill.

It was employed an homologous extinct vaccine, prepared from mammary secretion of infected cows, according to the method proposed by Mirri-Zavagli (1951, Bull. Off. Int. Epiz., 36, 336) for the vaccinal prophylaxis of the *contagious agalactia of sheep and goats*.

The results were slightly satisfactory. Under clinical point of view, eight days after the beginning of the vaccinal prophylaxis (two subcutaneous inoculations of vaccine, at a distance of ten days and 15 ml., respectively) all outbreaks were extinguished, including those characterized by rapid diffusion. Under immunological point of view there was evidence of antibodies in blood and milk serum of healthy-vaccinated cows three and five months after vaccination.

The vaccinal prophylaxis advantages are: smaller milk losses due to the rapid outbreak extinction; smaller cost due to the saving of the antibiotics for therapeutic and prophylactic purposes and frequently required for all cows in the outbreaks characterized by rapid diffusion; at least the nonconditioned use of the milk produced by treated cows.

Genetic Aspects of Cattle Breeding

Applicational Aspects of Some Genetic Polymorphisms in Cattle Breeding: Facts and Prospects

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This paper aims to give a general picture of what immunogenetics and genetic biochemistry can contribute to the study of the genetic aspect of cattle breeding at present and what they are likely to be able to contribute in the future.

As is know, the blood groups are considered to be the set of genetic markers present as antigenic factors on the walls of the red cells. More recently, the polymorphisms of the blood proteins,

revealed by electrophoresis, have come to be regarded as possible additional markers.

Animal biochemistry suggests that other body fluids such as milk, seminal fluid, saliva, and so on contain many other polymorphic characters with a genetic behavior, but knowledge of them is so far limited.

The set of all these characters identifies genetically the individual and hence the population. The scientific and applicational significance of this is clear to all.

It is interesting from the strictly biological point of view inasmuch as through the study of the genetic structure of each individual population it is possible to have more reliable knowledge of the genetic distances within species and between breeds. In the light of the scientific knowledge acquired, more advanced use of the available genetic variability can be planned for applicational purposes.

The possibilities of application and the prospects of the use of blood groups and of genetic biochemical polymorphisms are many. First of all, there is the unquestioned usefulness of blood groups in cattle breeding for: (a) identifying an animal; (b) for analyzing the lineage and possible disownment of paternity and maternity; (c) control of the lineage of calves born a little ahead of or after term; (d) subjects resulting from the uncontrolled covering of cows at pasture or in enclosures; and (e) study of freemartins and monozygotic twins. No one will miss the importance of all this in view of the fact that any quali-quantitative analysis of cattle production and any genetic improvement program must depend on the certainty of the offspring.

As to future prospects, some already have concrete possibilities of use and others are still fascinating research hypothesis. We would quote the following: (a) the study of the phylogeny of cattle breeds; (b) the study of the genetic evolution of breeds—populations under selection pressures; (c) the mean degree of kinship in an operating unit with a view to gaining better knowledge of breeding yields; (d) the relationships between blood groups, protein and enzyme polymorphisms of the blood and of milk and other biological systems with production characters; (e) the relationships between genetic polymorphisms and physiological and pathological features. These are avenues of research, viewed with prudent but reasonable confidence, that are of particular interest and relevance at the present stage in the history of cattle breeding.

The need for more intensive cattle production at all levels and for the exploitation of new areas of breeding is a spur to the rational utilization of the genetic variability of the species to be developed in the light of the phenomenon of heterosis for the yield characters that may benefit from this situation.

Hence, the need for methods of study that permit fuller knowledge of the genetic structure of a zooeconomically utilizable population for the foregoing purposes and of those subjected to selection for high production, which for this reason are often predisposed to a danger reduction of reproductive efficiency.

Foot and Leg Diseases in Modern Breeding Establishments

A Review of Factors Affecting Diseases of the Digital Horn in Dairy Cattle.

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The horn of the bovine digit represents a vital component of the integument. It may develop with primary congenital defects (*Keratogenesis imperfecta hereditaria bovina*) in which survival of the calf is impossible, and other secondary defects arise as a result of abnormalities of conformation or gait.

This paper is concerned principally with the horn of the bearing surface, the shape and area of which vary from individual to individual. Horn quality in terms of hardness and resilience varies from one area to another (sole c.f. heel). The horn of the posterior wall and heel grows 40% faster than that of the toe region in normal cows, the faster growing areas being formed from softer perioplic horn. Horn quality is thought to depend on numerous factors including nutrition, which is in turn related to productivity of the individual cow.

External factors playing a role in horn quality include the abrasive nature of some contact surfaces (concrete), the degree and duration of immersion in a moist environment, be it in muddy pastures or filthy yards, and the pressure-loading effect exerted in some tied stanchions and on slatted floors, all leading to excessive wear rates or to other horn defects.

A number of lesions arise as a result of the inability of cattle to compensate adequately for loss of wear and excessive physical stress on normal horn. Horn production is rarely depressed but quality is often poor due to hemorrhage in the underlying laminae. Investigations into laminitis have shown an association with parturition, and chronic unthriftiness can result due to persistence of an acquired poor stance to compensate for defective horn growth.

The typical sole lesion (Rusterholz) is another end-result of a chain of complicated adverse factors including defective stance, metabolic stress, and high production, and ending in poor horn production at a specific site.

Investigations into the specific properties of particular types of concrete floors, which depend, for example, on the amount and distribution of hard-wearing chips or carborundum dust, have shown the critical nature of this environment on many feet of cattle, which are already under stress due to a change of management system.

It is apparent that in intensive methods of husbandry, inevitably involving concentrations of cattle and increased production, diseases of the horny structures are assuming greater importance than diseases of the interdigital space. There is a particularly high risk in the period immediately following introduction to a new system.

Prophylaxis is never easy to institute, but critical evaluation of a correctly sited and well-maintained footbath to achieve an increased hardness and durability of hoof horn, and avoiding the excessive hardness and severe cracking which follows overenthusiastic application, is the best method to reduce this type of disease. Further attention must be given to installation of optimal types of flooring, both in the exercising and in the rest areas of cattle housing. Horn quality has been measured in terms of its mechanical response to weightbearing, its degree of hardness, amino acid composition, mineral, fat and ash analysis, as well as its histological components in experimental studies in the last ten years, and some of these results may prove directly of benefit to modern management systems.

The Radiological Findings of Diseased Legs in Intensive Dairy Cattle Systems in Israel

Bargai, U., Kibbutz Tsoraa, Israel.

Radiological examination of diseased legs in the Israeli cattle population is provided on a national scale by a portable X-ray unit which operates for the nation-wide veterinary service of "Hachaklait," which is an insurance company for livestock.

The examination is being carried out by the request of the practicing veterinarian and is free of charge for the client. During the years 1963-1973 a total of 134 cases of diseased legs or lameness in dairy cattle were radiologically examined, all were referred for radiography for diagnosis.

Table 1 includes the distribution of the cases by the anatomical site examined.

Table 2 includes the distribution of cases by the radiological diagnosis.

Discussion

Analysis of the tables reveal the following:

(1) In young cattle the most affected part of the extremities is the Femoro Tibial Joint (30%). Second to it is the Tarsus (22%). Both joints are hind leg joints.

(2) In adult cows the Phalanges are by far the most affected parts (35%).

(3) In dairy bulls, the Tarsus seems to be the most common site of disease (50%) whereas in beef bulls the Lower Phalanx (P III) seems to be affected most (55%).

(4) Fractures seem to be the most common disease condition of the legs in young cattle (23%) and cows (30%).

(5) Young cattle suffer more than twice with Degenerative Osteoarthritis as compared to adult cows (20% as against 9%).

(6) In adult cows, joint and bone infection cause the major lesions of the legs (23%) (11% osteomyelitis + 12% inf. arthritis).

(7) Dairy bulls leg lesions differ entirely from those of beef bulls. No legs and joints infection was diagnosed in dairy bulls, whereas several (5 out of 13) were diagnosed in beef bulls (Staricle).⁰⁰

The high percentage of fractures in young cattle could well be accounted for by the fact that the figure includes long bone fractures, slipped epiphysis and metacarpus and phalangeal injuries at parturition (see young cattle anatomical site table).

The high percentage of fractures of adult cattle legs in intensive systems are difficult to encounter at first, but it correlates with the extremely high figure of phalangeal lesions – where most fractures of adult cattle in Israel occur. Slides showing several of the local housing systems in Israel could well explain the predisposing factors in those systems which result in leg fractures. Those predisposing factors are: (1) slates, (2) large dried honeycomb muddy yards, (3) steps. In young cattle, the second most common lesion is degenerative osteoarthritis (20%) which correlates very well with the fact that the most common diseased part of the leg is the Femoro Tibial Joint (30%). This joint seems to suffer greatly at an early age with a local inflammatory process known as Gonitis, the etiology of which varies greatly but most commonly is trauma.

The high percentage of Tarsus radiographs in young cattle is related to the fact that spastic paresis is diagnosed mostly at an early age. Cases of this disease were diagnosed as early as three months of age and as late as nine years old in several dairy bulls.

It is noteworthy that the radiological findings in dairy bulls are very different from those in the pedigree beef bulls. Whereas most dairy bulls lesions were noninfectious joint lesions (8 out of 9), beef bulls suffer from infections, more fractures and soft tissue involvement. It is definitely the result of the different systems of management of the two kinds. Dairy bulls are permanently housed in only two insemination centers, very well groomed and cared for, whereas beef bulls pasture with the cows. It is interesting to note also that the Tarsus of the beef bulls is rarely affected (1 out of 9), whereas dairy bulls suffer with Tarsus infections greatly (50%).

General Topics

Frequency Among Fattening Calves in Austria of Sero-Reactors Towards Several Respiratory Viruses

Burki, F., Boeckmann, J., Institut fur Virologie, Tierarztliche Hochschule, Vienna, Austria.

The sera of 194 fattening calves, most aged four months with a few aged six months, were tested for respiratory viruses: 52% were positive for parainfluenza 3, from 83 to 23% for six different types of bovine adenoviruses, 26% for the virus of Bovine Virus Diarrhea (BVD), 54% for reovirus type 1 and 2% for the virus of Infectious Bovine Rhinotracheitis (IBR). These results justify active immunoprophylaxis against parainfluenza, especially at the beginning of the winter, against adenovirus type 4 throughout the year and against BVD selectively where it appears locally.

The Effect of Two Calcium Levels in the Dry Period Ration on the Incidence of Milk Fever.

Jonsson, G., Pehrson, B., Research Station of the Veterinary Institute, Skara, Sweden.

Based on information on the prophylactic effect on milk fever of dry period rations containing 35-40 gms Ca per day, a trial was carried out on 34 cows which had suffered from the disease at their previous calving. The experimental group (17 cows) was given 37 gms of Ca daily for the last eight weeks of the dry period and the control group (17 cows) 76 gms. The two rations were identical as regards energy, protein and phosphorus.

The number of milk fever cases was ten in the experimental group and seven in the control group. Two of the cases in the control group had serum Ca-values above 8.0 mg%/ml. The difference in disease incidence was not significant. It seems clear, however, that lowering the Ca intake to the lowest feasible level in Swedish dry period rations has no prophylactic effect on milk fever.

Spastic Paresis as a Cause of Removing Sires

Vlachos, C., Aristotelian University of Thessaloniki, Animal Breeding Center, Diavata-Thessaloniki, Greece.

In the course of the yearly assessment of the fertility of the sires of the Animal Breeding Research Center of Diavata 9% of the calves sired by the above bulls were found to be afflicted with lameness due to spastic paresis.

It was found that all these pathological calves were descendants of two sires of the station. On close clinical observation it was revealed that both these bulls suffered from a mild form of the affliction.

Considering that the above condition is of hereditary nature, the two sires were removed from the station.

The clinical symptoms of spastic paresis are described and suggestions for an early diagnosis of the condition are made. Histopathological lesions similar to those mentioned by Lewandowski have not been found in the C.N.S.

Metabolic Diseases of Cattle: Diagnosis, Therapy and Prophylaxis

On Enzootic Myodystrophy of Calves in Piedmont

Monti, F., Dotta, U., Balbo, T., Guarda, F., Istituto di Patologia Speciale e Clinica Medica Veterinaria, Torino, Italy.

After some considerations on the classifications of myopathies in domestic animals, the authors, on the basis of the data reported in the literature, and above all of those resulting from their research on the matter, take into account some aspects of enzootic myodystrophy in calves. Particular emphasis is given to:

(a) The modern aetiopathogenetic conceptions in the light not only of the dietary experimental experiences, but especially of the data resulting from the very many works devoted in many parts of the world to the study of the therapeutic and prophylactic action of both vitamin E and selenium in myodystrophy of calves, lambs and swine.

(b) The behavior of some enzyme activities in the course of myodystrophy and their utilization for diagnostic and prognostic purposes. In this connection, the following enzymes are considered: transaminases (GOT and GPT), aldolase (ALD) and relative isoenzymes. These last substances showed to be particularly useful, not only when confirmation of clinical diagnosis of skeletal or cardiac myodystrophy is wanted, but also as regard their possibilities of quantifying the participation of both the muscular-skeletal and cardiac areas.

(c) The clinical-anatomical aspects of myodystrophy, in particular as concerns the cardiac form. This last one has been divided into two groups according to the main pictures observed: the first of them was characterized by clinical, electrocardiographic and enzymatic signs of an acute myocardial degeneration, and essential characteristics of the second were the signs of a total cardiac insufficiency. In addition, the two pictures differ in their response to vitamin E and selenium therapy. In fact, the former responds to the referred treatment in about 50% of cases, whereas the latter does not respond at all and the disease has always a fatal termination. The anatomical lesions are represented as follows: in the first picture, by regressive phenomena (Zenker's degeneration, calcification) followed by reparative phenomena (proliferation of cells mesenchymatic in origin) showing an homogeneous evolution; in the second picture, by the concomitant presence of fibro-citrillar lesions evolved to different stages, along with small focuses of both Zenker's degeneration and calcification.

(d) Therapy and prophylaxis of myodystrophy. Myopathic syndrome frequently observed in Piedmont responds well from therapeutical point of view, as well as in other countries, to the action of both vitamin E and selenium. The combined vitamin E-selenium therapy has proved to be superior to the single administration of one or the other of the two drugs. This association has the capability of influencing in a favorable manner the courses of stated clinical pictures of myocardial dystrophy and when administered to mothers at the time of their last period of pregnancy, is likely to prevent the occurrence of myodystrophy in calves.

Metabolic Profile as Means to Discover Feeding Imbalances: Its Use for the Evaluation of Corn Silage Effects on the Metabolic State of Dairy Cows

Cappa, V., Bertoni, G., Galimberti, A., Italy.

Metabolic profile is the metabolic state evaluation of a dairy herd by the analysis of some blood metabolites on a significant number of cows. Since it is reasonably possible to know the normal values and the confidence limits of these metabolites and thus of the normal metabolic profile, it is also possible to get an idea on the metabolic state of herds by comparing the "normal" with their metabolic profile. This means of preventive medicine is based on the knowledge that abnormalities of blood composition can sometimes be linked with various clinical and subclinical conditions in dairy cows. During the last few years there was a great diffusion of the corn silage for dairy cows feeding. At the same time there was an increased diffusion of metabolic diseases (ketosis, low fertility and so on), thus the doubt that corn silage could be their principal cause.

For these reasons trials were carried out to show the corn silage feeding effects on some blood and urine metabolites to get a picture of the metabolic conditions of animals in respect to their health state.

For the experiments, carried out in three winter periods, Italian Friesian cows housed in the same way and divided in two groups were employed; the control group being fed with hay and the experimental group with different levels of corn silage. For either group the concentrate was able to cover all needs.

Periodically the cows were controlled for the following metabolites: (1) in blood: calcium, phosphorus, magnesium, sodium, potassium, chlorine, copper, PBI, hemoglobin, PCV, erythrocytes and leukocytes, glucose, urea, total proteins, albumin, globulins, SGOT, alkaline phosphatase, vitamin A and carotenes; (2) in urine: calcium, phosphorus, magnesium, sodium, potassium, ketone bodies. At the end of each experiment the liver function was also controlled by bromosulphalein clearance.

The results prove that the corn silage feeding does not produce abnormalities in blood composition. However, the corn silage fed cows have significantly higher hemoglobin values and improved liver function.

The fact that significant variations were not found for some metabolites, such as blood glucose and urine ketone bodies related to energy metabolism diseases or as vitamin A, P, copper and so on related to fertility, proves that a correct use of corn silage has no negative effects on dairy cows.

White Muscle Disease in Cattle in Czechoslovakia

Kursa, J., Hochschule für Landwirtschaft, Lehrstuhl für Veterinarwesen, Ceske Budejovice, Czechoslovakia.

Since 1969, that is when the first cases of muscular dystrophy in young cattle were described in Czechoslovakia, this disease has been reported repeatedly in several regions, especially in southern Bohemia and in eastern Slovakia. Young animals usually sicken after being put out to pasture in spring. Young beef calves fattened with milk substitutes develop the disease regardless of season or locality. Diagnosis of the disease was based on clinical, anatomopathological and laboratory findings. On the strength of cases in the field, Institutes of Veterinary Diagnostics were advised to add blood plasma enzyme determinations. The following are relevant to diagnosis: raised GOT, GPT, LDH, ALD and CPK levels and low AP levels. In stock farms at risk altered plasma enzyme values were found even in animals not presenting clinical symptoms (preclinical forms of "white muscle disease").

Sick animals presented lowered osmotic resistance of the erythrocytes, reflected in an increased hemolysis in solutions containing 0.588% sodium chloride. In calves affected with this disease and in other animals on the farm concerned with the resistance of erythrocytes to oxidative hemolysis (12.5% of total hemolysis) declined. The erythrocytes of calves receiving vitamin E supplement in their food proved resistant to H₂O₂ (absolute absence of hemolysis). The altered resistance of the erythrocytes is probably the outcome of altered permeability of the cell membranes

due to alterations of the lipids on the cell surface, related to an insufficient oxidative action of vitamin E.

In localities where white muscle disease is enzootic, initial studies of cattle hair and plants revealed low selenium values.

Ketosis in Dairy Cattle – Clinical Observations on Etiology and Prevention

Dirksen, G., Medizinische Veterinärklinik II, Giessen, Germany.

Ketosis in dairy cattle is a complex problem. Statements on etiology and prevention are given from the viewpoint of the clinician and with regard to the regional situation in Western Germany.

It is recommended to find uniform definitions on an international basis for the different types of ketosis. If a second internal disease is present beside the ketonuria (= secondary ketosis), the ketosis seems not to be really secondary in every case. In the author's opinion, it also can be the primary cause, for example, of an abomasal displacement or of an atony of the uterus.

Etiology. Endogenous and exogenous factors are acting together in the pathogenesis of ketosis; in Western Germany the alimentary causes are of chief importance. The following causes are stressed:

(1) Fattening condition of the cows before calving: predisposes the cow for ketosis because of an increased fat mobilization after parturition.

(2) Energy consuming strains and stress-conditions: besides the reduced feed intake, an increased energy requirement—for example, also by claw diseases—is to be considered.

(3) Primary liver diseases seem to play a role in liver fluke regions.

(4) Inadequate energy supply after calving: in high producing cows, problems are arising from reduced feed intake after parturition, from limited capacity of the stomachs for roughage and from difficulties of the regulation of the pH-value in the rumen. Frequently the reasons are of a more simple nature: omitted weighing of the ration, omitted calculation of the nutritive substances, false estimation of the nutritive content of the feed, false feeding technique, bad palatability of the feed and others.

(5) Fat content of the feed: responsible for the ketogenic effect are saturated fatty acids of 5 to 14 C-atoms. Particularly coco-, palm-, and babassu-fat, respectively corresponding feed cakes, containing these fatty acids. Preliminary recommendation: fat content of the whole ration (concentrates + roughage) below 600 g digestible fat or 800 g crude fat. Type: fat-ketonuria commonly takes a subclinical (atypical) course. (6) Silage of butyric acid type: The high butyric acid content increases ruminal ketogenesis; simultaneously the content of the nutritive substances (lactic acid, protein) is reduced.

(7) Ketogenic situation of the digestion in the rumen: under certain feeding conditions the proportion of the volatile fatty acids can change in favor of butyric acid. In consequence of that change, ruminal ketogenesis seems to increase.

(8) Pasture-ketosis: As possible causes are discussed: insufficient energy supply, ketogenic products of the digestion in the rumen, ketogenic effect of the high fat content in young grass. Pasture-ketonuria often is combined with hypomagneseemic tetany.

Treatment and prophylaxis. To avoid failures, a thorough clinical examination and the checking of the feed should precede every treatment. Measures for prevention of ketosis primarily should be directed to avoid the causes mentioned.

In problem herds, weekly examination of urine or milk for ketonbodies should be carried out in high lactating cows. When feeding glucogenic substances to susceptible cows, the composition of the ration has to be considered. In high producing cows, attention has to be paid to the genetical aspects of ketosis.

Experiences with Surgical Treatment of the Larynx in Cattle with Special Consideration of Calves

Fischer, W., Klinik für Rinderkrankheiten der Tierärztlichen Hochschule, Hannover, Germany.

A report is given upon a method of surgical treatment of the

larynx by laryngofissure and the experiences obtained in 23 calves and adult cattle. In nearly all cases the animals suffered from localized diphtheroid, necrotizing or absceding laryngitis, specific or aspecific granulatory hyperplasia, inflammatory edema and unilateral paralysis of the vocal cords. These lesions ensued in high-grade dyspnoea combined with laryngeal stridor. Tentative prior treatments with antibiotics or sulfonamides had remained unsuccessful in all cases. In comparison to conservative therapy, a higher percentage of animals (i.e., 17 out of 23) can be cured by surgical measures.

Investigations on Chronic Furazolidone-Poisoning in Calves ("Hemorrhagic Syndrome")

Hofmann, W., Medizinischen und Gerichtlichen Veterinärklinik, Justus Liebig Universität, Giessen, W. Germany.

During the last years, several reports were published on a hemorrhagic syndrome of unknown origin in calves fed by milk replacers (see Grunder H.D.: VI. Intern. Meeting on dis. of cattle, Philadelphia, 1970).

Our experiments, undertaken in order to elucidate the etiology of this disease in the German Federal Republic, revealed a connection of the hemorrhagic diathesis with a permanent medication of furazolidone.

After 7-10 weeks daily doses of 8.0-8.5 mg furazolidone per kg of bodyweight, given to eight calves, led to hemorrhagic diathesis and death. The increase of bodyweight was reduced in the experimental animals already after 3-4 weeks of furazolidone-medication.

The disease shows two phases: first, petechias appeared already in the 4th week of the experiments but were reabsorbed 2-5 days later (first phase). After a 3 week period free of any troubles a second phase of petechias and ecchymoses followed. Some days later the calves died. Medication of 6.0 resp. 4.0 furazolidone/kg body weight to two calves each also led to hemorrhagic diathesis, but the survival time was prolonged up to 15-24 weeks.

The main hematological alterations in all cases were thrombopenia and granulopenia or agranulocytosis.

The most important morphologic changes of the calves were hemorrhagics. Focal necrosis occurred in the pharynx and in the mucous membranes of the intestines. In biopsies of the bone marrow, hemopoietic tissue was diminished or aplastic. In some cases, first and reversible alterations could be seen already after one or two weeks of medication with the 8.0-8.5 mg/kg bodyweight furazolidone doses.

On the basis of these findings, long lasting medication of furazolidone in daily doses of 4.0-8.5 mg/kg bodyweight or more to milk fed calves is no more justified.

Furazolidone-medication not only may lead to hemorrhagic diathesis but also reduces body resistance to general infections due to leucopenia.

Use of an Inactivated Calf Virus Pneumonia Vaccine

Stone, D., Simm, P. D., C-VET Limited, Telford Road, Houndmills Estate, Basingstoke, England.

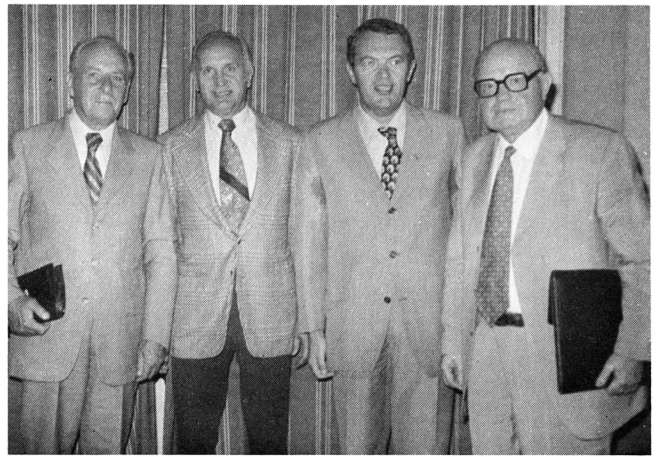
A pentavalent calf virus pneumonia vaccine has been in common usage in the United Kingdom for the past three years. The vaccine contains inactivated virus antigens to Parainfluenza 3, Adeno 3, Reo 1, Infectious Bovine Rhinotracheitis and Bovine Viral Diarrhea/Mucosal Disease.

The serological response to the vaccine has been measured in over one thousand calves and a systemic antibody response has been demonstrated above that considered protective. Recent trials have assessed the effect of maternal antibody on vaccine response and shown the maternal antibody has only marginal effect on the final antibody level achieved when using a three dose vaccination system.

The inactivated vaccine produces some local antibody response following intramuscular injection and a detectable but low systemic and local response following intranasal application. The relationship of this and other information in regard to future trends in vaccination schemes will be discussed.



Opening Ceremony.

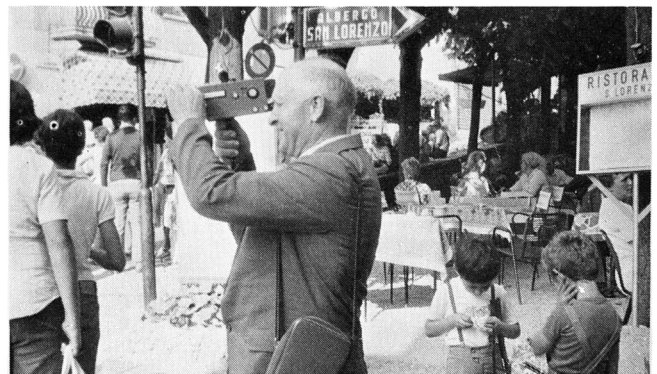


L. to r.: Prof. Dr. E. Seren, Dr. Harold Amstutz, Prof. Dr. Vacirca, and Prof. Dr. Gustav Rosenberger.



AABP President Dr. L. Mac Cropsey and Dr. D. Dowling, Australia.

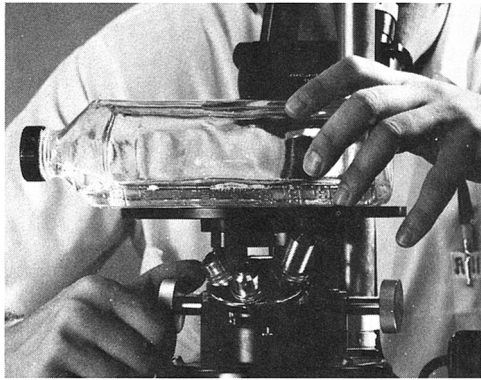
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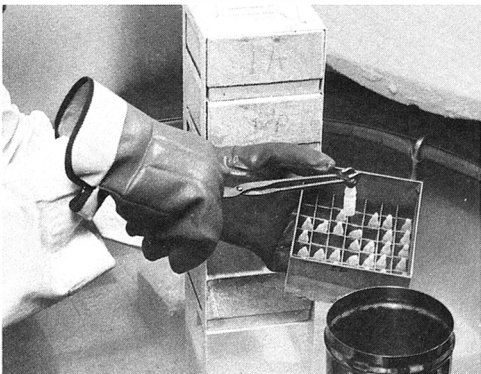
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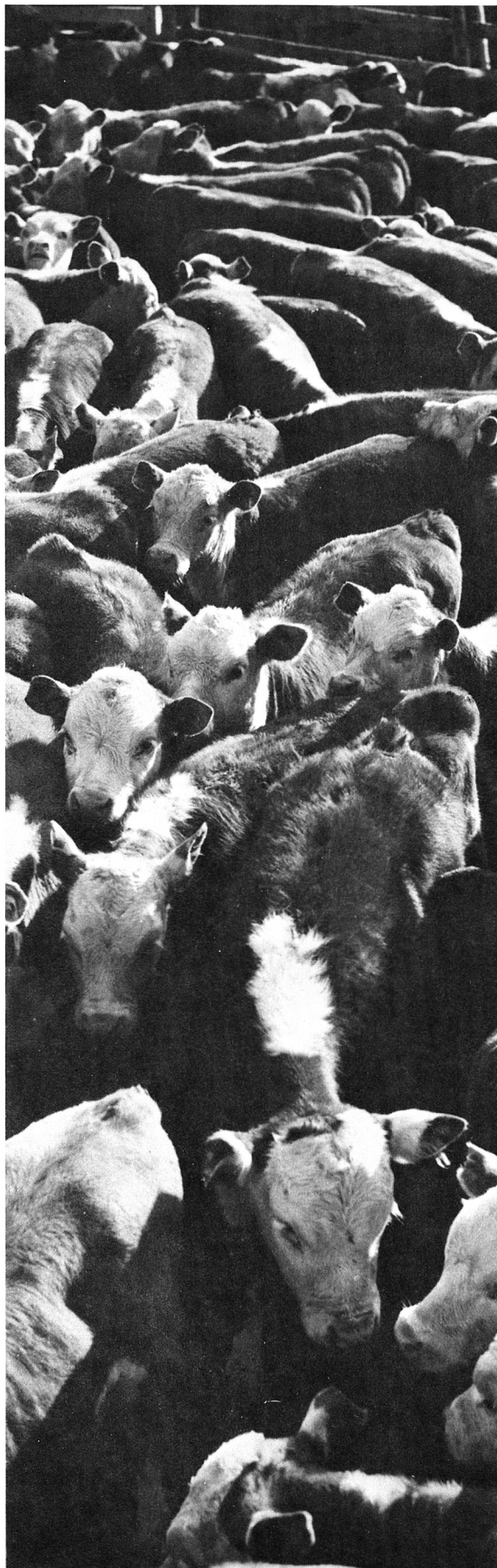
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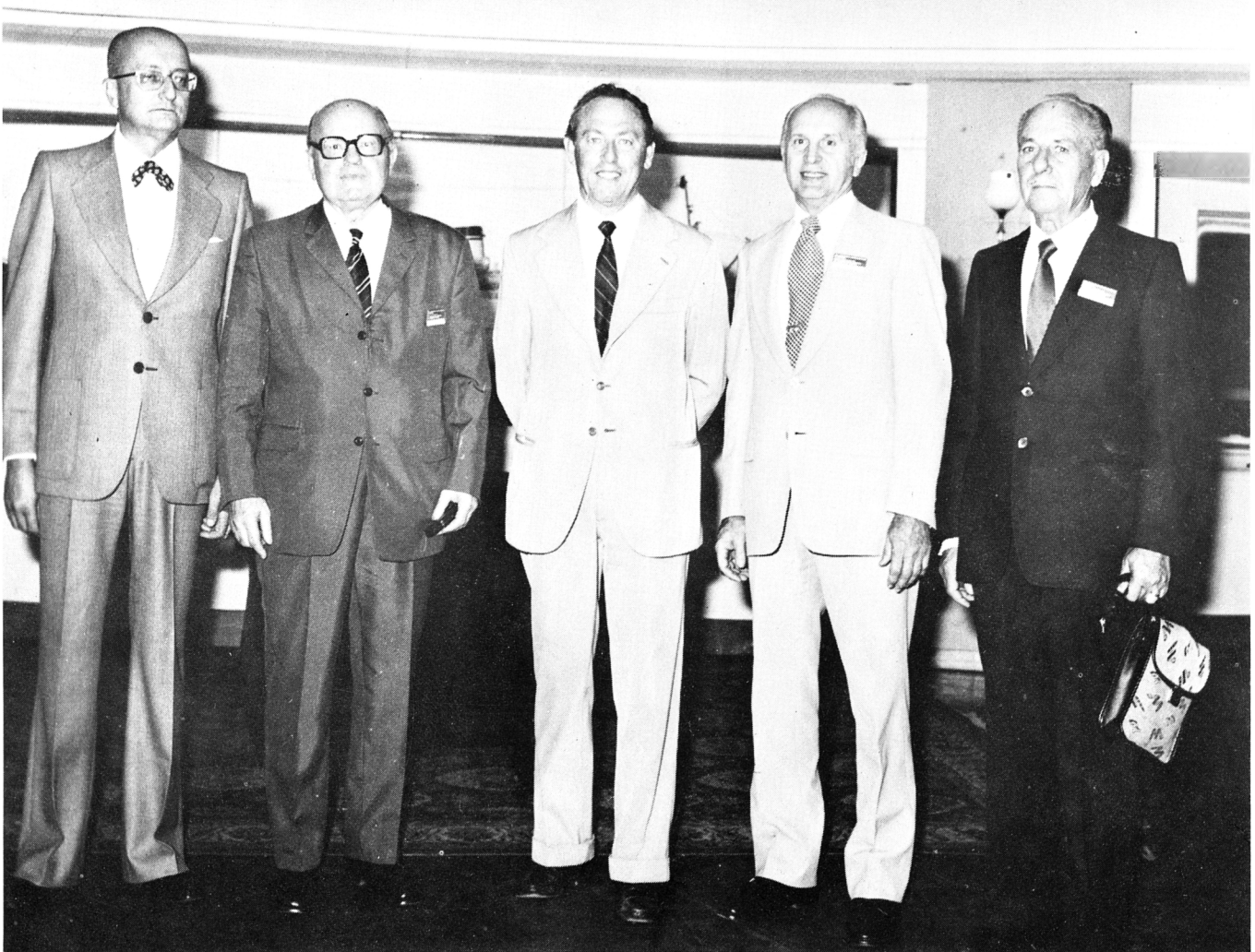




Dr. Harold Amstutz receiving a medallion from a Milan city official.



AABP Delegation: Dr. John Noordsy, Dr. L. Mac Cropsey, and Dr. Harold Amstutz.



Civic Reception

20th International Veterinary Congress

Thessalonika, Greece July 6-12, 1975

Program for Section X (Clinical Studies in Ruminants)

Session 1

Diseases of the Respiratory Tract in Young Bovines

1. R. A. Willoughby, Guelph/Canada: Energy losses resulting from the increased work of breathing in calves with pneumonia.
2. R. G. Thomson, Guelph/Canada: Pathogenesis of bacterial pneumonia in cattle.
3. Bruce D. Rosenquist, University of Missouri, Columbia/USA: Rhinoviral and respiratory syncytial viral infection of calves.
4. G. Witzigmann, Mikrobiol. Institut, Munchen: Vakzination gegen die enzootische Pneumonie des Rindes.

Session 2

Stomach and Intestinal Disorders in Young Animals

1. W. I. Mutovin, Laboratorium des Allunions-Instituts, UdSSR: Ueber Natuerliche antibakterielle Stoffe des Blutes und der Milch.
2. Gabel H. Conner, Michigan State University, East Lansing/USA: Prenatal Immunization of the Bovine Fetus against Colibacillosis.
3. G. Baljer, Mikrobiologisches Institut, Munchen: Orale Vakzination neugeborener Kalber gegen E. coli-Erkrankungen.
4. J. W. Lesslie, Central Veterinary Laboratory, Weybridge/England: The development of a British standard for multi-component clostridial vaccines.

Session 3

Disorders of the Metabolism in Bovines

1. Sv. Nikov, Iv. Semov, A. Pophristov, H. Lalow, A. Tsvetkov, St. Antonov, S. Semeonov and others. Higher Veterinary Institute, Sofia/Bulgarien: Study on the degenerative Osteoarthritis in fattening calves.
2. H. J. Breukink, Innere Medizin Utrecht/Niederlande: Influence of level of concentrate in the ration on VFFA-levels in ruminal, abomasal and duodenal contents.
3. Lars Ekman, Goran Jonsson, Lars-Erik Edqvist, Skara and Stockholm/Schweden: Gonadal hormones and hydroxyproline in the blood of cows with parturient paresis.
4. R. G. Blowey, Langford Bristol/England: The use of metabolic profiles as an aid to diagnosis of suboptimal production of cattle.

Session 4

Disorders of Reproduction in Bovin

1. D. E. Monty, Arizona State University/USA: Heat stress, estrous cycle characteristics and infertility in the dairy cow.
2. R. B. Miller, Guelph/Canada. Intestinal lesions in aborted bovine foetus.

3. William T. Hubbert, Louisiana State University/USA: Biology of Bovine Fetal Infection.
4. D. L. Stewart, Central Veterinary Laboratory Weybridge/England: Some factors affecting the reproductive efficiency of dairy cattle.

Session 5

Mastitis in Bovines

1. G. Grootenhuis, Central Veterinary Institute, Rotterdam/Netherlands: Hereditary defined differences in susceptibility for mastitis.
2. J. Kovats, Szekesyard/Ungarn: Rolle der Hygiene in der Bekampfung der Rindermastitiden.
3. Roderic J. T. Hoare, Glenfield, N.S.W./Australien: Mastitis Control Programme—Economic benefits and extension implications.
4. A. N. Golikow, Veterinar-Akademie Moskau/UdSSR: Bioelektrische Stimulation der Milchabgabe und Prophylaxe der Mastitiden bei Kuh.

Session 6

The Role of Fusiformis Nodosus in Diseases of the Claw in Sheep and Bovines

1. E. Toussaint Raven, Clinic for Surgery, Utrecht/Netherlands: Abnormal claw conditions in bovines supposed to belong to the syndrome of Fusiformis nodosus infections ("slide view").
2. A. K. Gray, Central Veterinary Laboratory, Weybridge/England: The use of serological tests to evaluate the immune response to footrot vaccines.
3. U. Reuss, Tiergesundheitsamt Oldenburg i.O./W. Germany: Vakzinationsversuche gegen die Moderhinke der Schafe.
4. John B. Kerry, Wellcome Research Laboratories, Beckenham Kent, U.K.: Experiences in foot rot-vaccination in sheep.

Session 7

Brucellosis of Small Ruminants (Sheep and Goats)

1. Hermioni Papakiriakou, Veterinary Microbiological Institute of Athenes/Greece: Isolation of strains of Brucellosis from pathological material of small ruminants.
2. Gaumont, Laboratoire Central de Recherche veterinaires, Maisons-Alfort/France: Immunization de la brebis contre l'infection experimental a Brucella melitensis—Comparison de 11 vaccins.
3. M. M. Ivanov, Laboratorium des Allunions-Instituts, UdSSRRR: Spezifische Prophylaxe der Brucellose der Schafe.
4. A. Mc. Diarmed, Institute for Research on Animal Diseases, Compton, Newbury, Berks./England: Brucellosis in deer.



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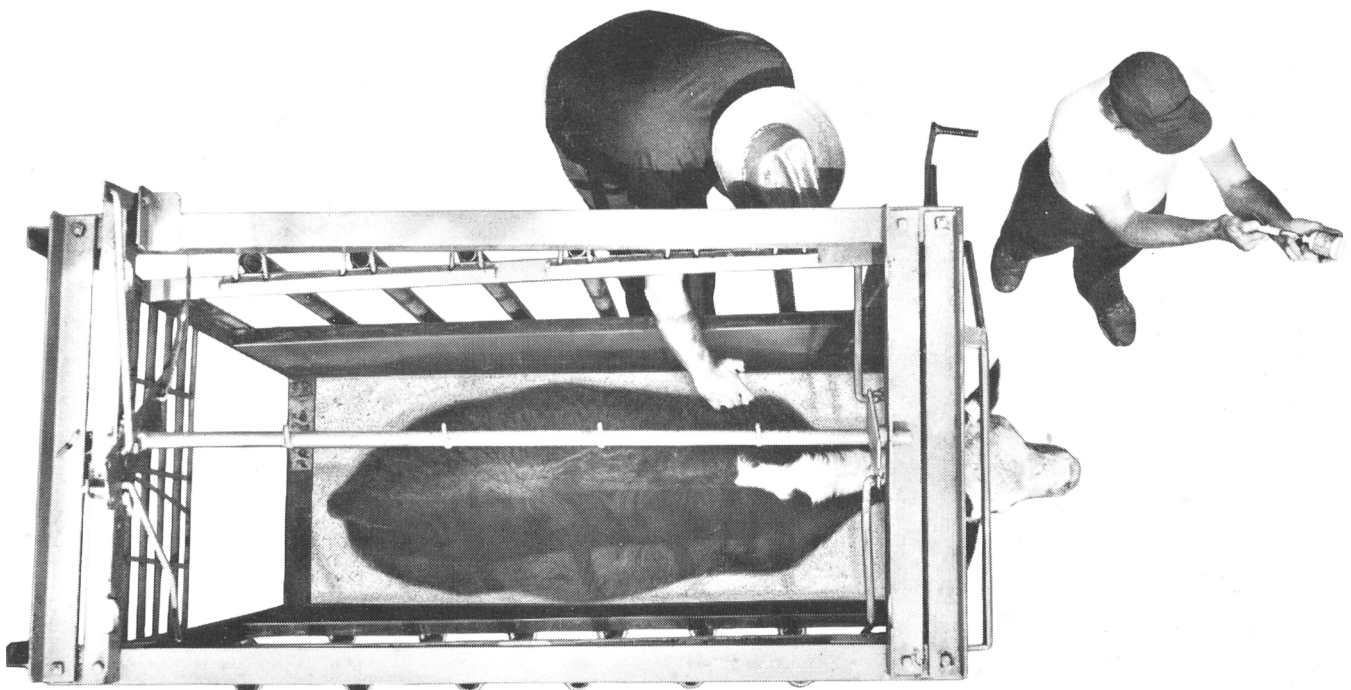
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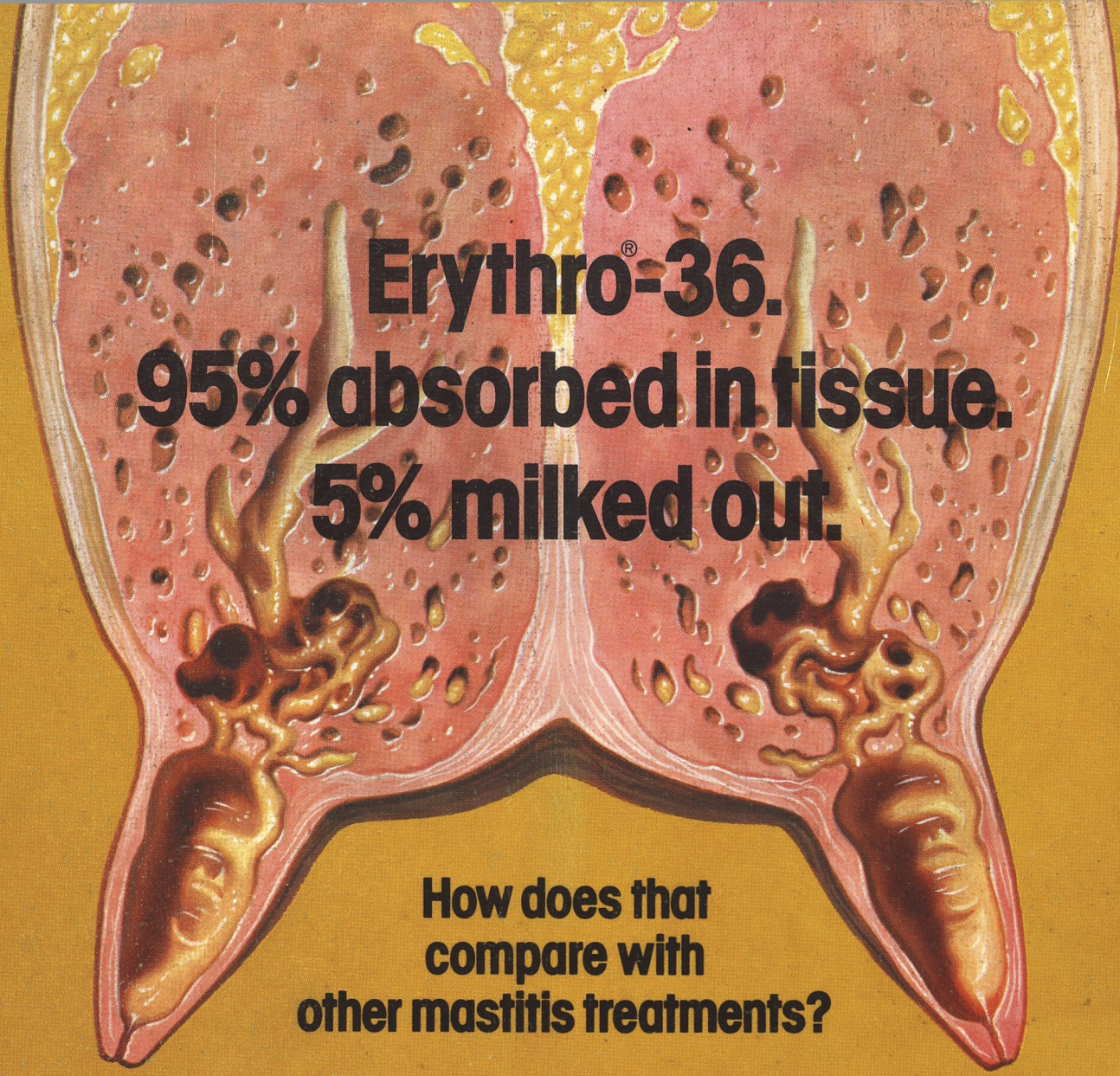


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