British Cattle Veterinary Association Conference: Cattle Management and Disease

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A conference sponsored by the British Cattle Veterinary Association involved twenty-six speakers contributing over a three-day period, as well as a large poster display. The meeting was held at the Nottinghom School of Agriculture, Sutton Bonington, on April 13-15, 1981, and attracted just under a hundred veterinary surgeons to all or part of the meeting. The main topics covered were reproduction, computers, milk quality, breeding, practice laboratories and growth promoters as well as several clinical contributions. Credit for this comprehensive programme must go to Dr. David Weaver, B.C.V.A. Programme Secretary.

Bob Plenderleith (Glasgow University Veterinary Practice) began with a punchy contribution on "Treatment of uterine prolapse". The practice had changed its technique for this condition following a paper by Cagienard of New Zealand in "Veterinary Practice" during 1979. The method involved putting the animal on its belly with the hind legs pulled back behind it. The farmer sat astride the back and held the tail straight up. Fifteen cases had been treated since October 1980, they were of varying breeds, aged between 3 and 8 years and variously housed. Only 6 out of 15 had milk fever and 2 had dystokia. The results were successful in all but two cases, one of which had a paresis due to mucky slats and the other subsequently sustained a fractured femur by slipping over. The method was approved of by all members in the practice who had used it and required a minimum of labour, drugs and physical effort.

Showing that it was possible to undertake critical therapeutic trials in practice, **Dr. Graham Duncanson** (North Walsham) gave a talk entitled "Retained placenta and endometritis, treatment and control". The work was undertaken in a pedigree Ayrshire herd served by a bull or AI with a high service to conception ration of 2.4, and which had routine weekly visits. Placentae were removed traditionally at about 4 days post partum, and pessaries inserted. If a muco-purulent discharge developed one of four treatments was instituted, i.e. stilboestrol diproprionate (2 ml intramuscularly); cloprostenol (2 cc intramuscularly); intra-uterine injection of 500 mg oxytetracycline hydrochloride, 500 mg furazolidine, 500 mg iodochlorhydroxyquinoline and 0.5 mg ethinyloestradiol; or untreated control. When treating metritis no excessive palpation was undertaken so that it was not possible to tell if a corpus luteum was present. Treated cows were checked fortnightly and considered cured when no purulent discharge was present on uterine examination. Eighteen animals had a very severe metritis requiring both parenteral and intra-uterine antibiotics. Out of 437 calvings, 278 showed retained placentas (63.3%) and 140 had endometritis (32%). Younger cattle had less metritis (19%) than older ones (53%) . There was a higher rate of endometritis where the calving index for that herd was over 365 days (18%) than when it was under 365 days (72%). High yielders showed more cases (44%) than low yeilders (10%).

Comparison of treatments for endometritis showed that with stilboestrol 12 out of 35 treated did not subsequently breed, many due to cyctic ovaries, and the calving to conception interval was 185 days. In the other three groups all subsequently became pregnant but the calving to conception interval varied from 105 days for cloprostenol to 142 days for intra-uterine treatment and 141 days for controls. The visits were changed to monthly and where animals had a retained placenta over 12 hours it was removed as well as could be done and four pessaries inserted. Of the 19 treated, in 10, total removal of the placenta occurred and only one sebsequently developed metritis. However, of the 9 where only partial removal was possible, 7 developed endometritis and in 3 it was severe. Concern was expressed by the audience at the high prevalence of retained placentas but despite investigations over more than a decade no satisfactory explanation had been found.

A review paper was presented by **Dr. Andy Peters** (Meat and Livestock Commission) on oestrous cycle control, principles, problems and prospects. Most failures of fertility were blamed on management and so artificial control of the oestrous cycle could have advantages in obviating the need for oestrous detection, facilitating use of artificial insemination, allowing fixed time AI and allowing batch management for insemination and calving. In the normal bovine cycle at day 16 to 17 the endometrium produced a luteolytic factor possibly prostaglandin F2d which caused a fall in progesterone levels. This allowed a slight rise in the baseline of luteinising hormone (LH) and permitted oestradiol production. Follicular stimulating hormone was at a low level before oestrus, there was then a large surge and a secondary smaller rise 24 hours after the main peak, synchronous with ovulation. The LH level gradually rose from day 18, but it was not a continuous rate of excretion but occurred as pulses or episodes which came every two hours or so. The frequency of this pulsative or episodic excretion was important in follicular development and each pulse is due to a single excretion of gonadotrophin releaser hormone

(GnRH) from the hypothalamus. Large doses cause the LH surge which results in ovulation.

The duration of oestrus was 16.9 hours, the interval from onset of oestrus to LH peak was 6.4 hours, duration of LH peak was 7.4 hours, the interval from LH peak to ovulation was 25.7 hours and ovulation was about 15 hours from the end of oestrus. Up to 30 days post calving there was little progesterone activity but it then increased, but even at 75 days post partum some cows had a lack of ovarian activity. By day 40, 92.4% of cattle had ovarian cyclicity and by day 50, 95% showed cyclicity. Acyclicity was not a problem in dairy cows but in beef herds there was much variation. There was a relationship between bodyweight and onset of ovulation and also season of calving was important, onset of ovarian activity being 83 days in the spring and 44 days in the autumn.

Methods of oestrous cycle control depended on mimicking the progesterone fall. This could be accomplished by decreasing the length of the luteal phase (luteolysis) - prostaglandins; and increasing length of luteal phase - progestagens. Prostaglandin injections at 11-day intervals resulted in synchronization of oestrus in cycling cows but was of no use in cows without ovarian activity. Also some cows had a long period of low progestagen activity and did not respond to the second prostaglandin injection. Progestagens can be given by injection or in feed or implant. Implants were useful but not at present available commercially, but a progesterone intra-vaginal device (PRID) was available. The length of any progesterone treatment altered prognosis, if it lasted 18-21 days fertility was 40% but with 8-10 days treatment fertility was equivalent to controls at 55%. Shorter progesterone treatment required luteolysis to produce synchronization and this was undertaken by oestradiol. Withdrawal of PRID results in oestrus and this can work, even in acyclic cattle. Possible future methods of control will include prostaglandin and GnRH and PRID/prostaglandin combinations.

A research worker from the Nottingham School of Agriculture, **Dr. Peter Hall**, described "Milk progesterone profiles and the diagnosis and treatment of subfertility in dairy cattle". Thrice weekly milk progesterone levels were obtained from about 1600 cattle all in well fed and managed units. Ovarian cyclicity had commenced in most cattle by 35 days post partum. The most common problem was failure to detect oestrus in cycling cows. Often first one or two cycles were seen but then at the critical time oestrus was not observed. Progesterone profiles indicated the stage of the cycle so that a single cloprostenol injection could be given in mid-cycle. This treatment reduced calving to conception interval compared with untreated controls both when it was followed by either fixed time insemination and insemination at observed oestrus. However, observed oestrus insemination produced a better conception rate. Work with tail paste had increased detection rate by 20% and some work had been undertaken with prostaglandin and tail paste.

Acyclic cows were defined as those which had not started to cycle by 35 days post partum. Such cattle were injected with GnRH 42 days post partum or PRID was inserted from day 48 to 58 with insemination 2-3 days after removal. Calving to conception intervals were 97.4 days in controls, 88.7 days for GnRH, and 80.0 days for PRID. Persistent corpus lutem occurred in 2-3% of cows and could be controlled by luteolysis. Embryo losses occurred in less than 10% of cows but were more common in older cattle. They could be defined as animals with a high progesterone profile for 25 days provided previous normal cyclicity. If cows were inseminated too close to calving more losses occurred; also the role of viruses and toxins in feed samples was being examined. Another cause of embryo loss was insemination during pregnancy; this happened to about 5% of cows and a third of these inseminations led to embryo loss.

Oestrous detection is always a problem and could be as low as 55% according to **Dr. Barry Harker** (I.C.I.) who discussed "Tail paste as an aid to oestrus detection". Several factors contributed to the poor observation rate and these included stress in high input - high output systems, increasing difficulty in finding time to watch, split herds also did not help. The duration of oestrus was very variable being less than one to 30 hours with an average of 12 hours, and one fifth of all heats were under 6 hours. The problems rose as less time was taken for oestrous observation. Cattle might mount every 10 minutes to 20 minutes or less frequently, often inspections were not taken when the animals were quiet, but around feeding or milking times. Sometimes herdsmen were not as aware as they would have you believe of the signs of oestrus. Many cattle presented for insemination were not in oestrus because of unreliable ear tags, duplicate ear tags, inadequate illumination, access problems, etc.

The remedies for poor oestrous detection included providing more time to detect oestrus. Ideally there should be three half-hour periods per group spaced throughout the day. The cattle should be clearly identified, not disturbed and charts should be kept of bulling. Aids for oestrus included chin ball markers but bulls were expensive and inconvenient to use. Tail marking was one method of control, the paint had to be placed on the rubbing point of the tail which was the crest in front of the tail head. The system has been practised in New Zealand for many years using household gloss paint. The results in Britain were not satisfactory due to climate and management, and instead a water-based paint, which was thicker and dried quickly, was used. As it was thicker it did not tend to splash about and, as it was water-based, it came off clothes and paint brushes and could be washed in water. A trial of tail paint was conducted with progesterone assay and a low level was considered a "possible oestrous event". It was found that 92% of 168 oestrous events were detected. It was however important to paint the right area and the paint must be down to skin level. The cattle then had to be able to interact and the strip should be inspected daily. Occasionally incorrect diagnosis occurred because of incorrect application, false oestrus, etc. The paint could be applied to cattle in calf to show any still cycling. Dr. Harker also pointed out that in some instances the cowman would not accept tail paint as the concept seemed to challenge the cowman's competence at oestrous detection.

New work on β carotenes and fertility was presented by **Dr. Peter Jackson** of I.C.I. who spoke on "Nutritional influences in steroid hormone production". A crude assessment of nutrition to cows had correlated with conception rate. Thus 330 cows on a poor diet had a conception rate (CR) to one oestrus of 31.4%. 451 cows on a medium dietary plane had a CR of 48.9% and 483 cows with good nutrition had a CR of 55.5%. Subsequently work had been undertaken with 12 Friesian cows 76-100 days post partum kept on a marginal diet for 2-3 weeks and then given a double prostaglandin programme with fixed time insemination 72 and 96 hours after the second injection. It was found there was a correlation between β carotent status and conception in these cows. Subsequently 20 two-year old heifers were blood tested and rectally examine every four hours after the second prostaglandin injection in June and December. In December they received a straw based diet with low β carotene. In June there were higher plasma β carotene levels, more animals ovulated, the follicle size was large, the ovulations occurred earlier and there were higher blood cholesterol and progesterone levels.

It appeared that β carotene possibly plus lipoproteins acted as a catalyst and transporter of cholesterol and its subsequent transformation into progesterone, testosterone and oestrogen. Predictably ovulatory dysfunction and cyclic irregularities appeared to increase as steroid hormone production decreases. This might be a factor why fatty liver syndrome and chronic liver fluke cause a drop in fertility. Thus if β carotene and cholesterol levels were low there was a smaller follicle, oestrus was not so obvious, there was a lack of the oestrogen trigger and a delay in LH peak. There was thus delayed ovulation or anovulation and if the animal became pregnant progesterone levels were less marked and so there might be early foetal death.

The first of two talks on computers was by **Dr. Brian Rawson** (Stratford-upon-Avon) who discussed "My practice computer, herd records and fertility control". He said he had made a conscious decision to be involved with computers as he thought that as a practising veterinary surgeon his most important skill was the sale of professional advice. He had undertaken preventive medicine to farmers but found it difficult to sell, as he was not giving the best possible professional service to his clients, being unable to discuss in detail herd health policy to owners or managers remote from the farm. One problem was that he did not have access to farm records and so he did not have the available information. Time on the farm was not as effectively spent as possible. In his practice he did most of the routine herd health work and when he wanted to have a holiday this work had to stop or his partner did it, often not knowing what had previously been done. The use of the recording system allowed veterinary surgeons to tell if the best return on investment was coming from the herd, the manager was able to assess if the herd was managed efficiently and the herdsman was able to know what was happening in the herd.

A main frame computer was decided upon to do the work because firstly, the person next door was a computer expert and at the time the programme was initiated - four years ago -it could not be taken by a smaller machine. He was able to offer a bureau service so that capital was not tied up in hardware. The next problem was what information to collect, but it was thought essential to know calving date, heats observed, next heat due, service date, pregnancy diagnosis date, drying off date due to calving. Helpful records included if one herd had a calving problem, reproductive tract examination, illness, treatments, death or culling. The records allowed a calving index to be produced, conception rate, it also identified problem breeders, drying off date, date due to calve, heat next due, service date and pregnancy diagnosis data. The programme needed four overriding factors, it had to be simple, accurate, available and up-to-date. Data were collected on duplicated sheets of two types and everything was recorded by coding, except milk yield and feeding. The information was collected at the routine herd visits. A performance summary was made for each production class and other lists provided animals to be seen on the next routine fertility visit.

Dr. Richard Rowe (Wotton-under-Edge) had a computer for an entirely different purpose, and he told us about "My practice computer; book keeping and practice economics". They had bought their machine because their lady bookkeeper had threatened to leave. They then realised that most of what she did was in her head and not written down, so they decided to record the system and also to think about installing a computer. The criteria defined for the computer were that it was to store drug information and update it, to keep the small animal records, it must have adequate storage, fast access and the information retrieval and input was to be in words not codes. This rules out most of the systems and the next criterion was the system had to be cheap. Luckily they had come into contact with a computer analyst hoping to enter the veterinary market and so he had produced a system for them which cost about £50,000 to initiate but which cost then relatively little. The system involved a desk top computer with solid discs and visual display unit. They used it to keep records for individual clients and recall all information by entry, it priced work at standard rates for mileage, time on the farm and drugs used and any price could be altered if so wished. It priced drugs and did stock control as well as adding VAT. It was able to print invoices and issue warning/vaccination reminder to clients. Small animal client records allowed recall of the animal's history.

The final session on the first day was in lighter vein and was a presentation by **Dr. Ian Baker** (Aylesbury) and **Dr.**

Roger Eddy (Shepton Mallet) about Israel and the Eleventh International Buiatrics Congress held in October 1980. The conference was held in the fortress-like Hilton Hotel. Israel took a bit of getting used to as you were warned not to leave anything on the beach while swimming as it would disappear and you were not to pick up strange objects as they might be mines or bombs! However, the speakers said they felt incredibly safe in the country! Routine large animal veterinary practice was undertaken by about 70 veterinary surgeons who worked for an insurance company. This insurance cost £11-£12 per animal. The practice was run from the veterinary surgeon's home and appeared quite leisurely; drugs were collected once a week or so from a depot.

In 1976-77 Israel was in deficit on her agricultural products; now she had a surplus of 780 million dollars with 23% of exports going to West Germany, 13% to Britain and 12% to France. There were no agricultural exports to the USA possibly because the majority were fresh foods. The largest export crop was citrus fruits but vegetable, fruit and flowers were all increasing. Livestock production was small and while field crops were expanding, cattle were contracting. There were 108,000 dairy cows producing 730 million litres of milk. The cattle were of the Israeli Friesian breed and 100% AI was used, more than 50% of animals were in a computerised recording scheme. Yields were 7858 kg at 3.37% fat, with the average of those three times milking being 8034 kg, that of twice milked 7574 kg and the family herds being 6941 kg. About three-quarters of the cattle were milked three times a day. The herds were divided into the larger ones of 200-450 cows run by a kibbutz - a type of commune, and others of 30-40 cows which were moshav or family herds.

The cattle were zero grazed and grass formed only a small part of the diet. Each cow ate 65 tonnes DM a year with 5 tonnes being concentrate and cotton waste. Calves were tethered by the ankle and the cattle did not graze but lived in roofed loafing areas. The kibbutz had no shortage of workers; an example seen had 12 men looking after 280 cows. The moshavs had 5 hectares of land each. The herds often had a routine weekly fertility visit, their calving index was 370 days but mainly due to a very high culling rate of 30% (half due to infertility). The concentrates fed had 12% crude protein and cost about £100 per tonne. They received about 13p per kg of milk and this price was on a quota basis and index linked. The output per cow in 1979 was £730 compared with £505 in the UK, with a gross margin of £380 compared with £271 in the UK.

Recent changes in the compositional payments policy for milk had focussed attention on milk quality and so the morning of the second day was devoted to this important subject. **Mike Warren** of the Milk Marketing Board began by discussing "Payments for milk quality and future trends in the UK and EEC". The average composition of Friesian milk was butterfat (B.F.) 3.8%, solids not fat (S.N.F.) 8.7% consisting of 3.3% protein, lactose 4.7% and ash 0.7%, and 87.5% water. Between 1964 and 1980 both B.F. and S.N.F. were valued equally. The sales position of milk had, however, changed in that in the 1960's 77% milk went to the liquid market whereas by 1980 the proportion was less than 50% with butter and cheese production becoming of greater importance. Thus fat had become more important and so since May 1980 B.F. had commanded a 65% price premium over S.N.F. The price received by the milk producer was the average of the 12 months' quality tests and was reviewed every 6 months in May and November.

Milk was tested four times for hygiene. There was no deduction for the first failure in any 6-month period, but a second failure producing a 0.37p/litre failure on all milk that month with increasing penalties for subsequent failures. The penalty was to encourage milk less likely to souring or contamination of manufactured products. There had been a tightening up in antiobiotic testing since October 1980. At least one sample was tested a month and the first failure caused a deduction of 5p/litre on that consignment of milk, and heavier penalties for subsequent failures. At present the antibiotic failure rate was about 1.3% of all samples. The presence of sediment did not at present produce a price deduction but if a problem the MMB visit the farm and 7-800 visits were made annually. There are several new developments in the pipeline with the MMB being responsible for weekly central testing of all milk samples for composition, hygiene, and antiobiotics from May 1982. Future changes might also include a total bacterial count for hygiene testing, the identification of the antibiotic present in antibiotic testing procedures, protein testing so that payments could be made on B.F., protein and other solids with market values applied to each constituent, and a contemporary rather than retrospective payment scheme for compositional quality.

A joint presentation came from **Drs. Bill Broster and John Sutton** (National Institute for Research in Dairying) on "Milk quality, some nutritional and managerial considerations". When thinking of milk quality it was impossible to separate it from yield and the two were generally inversely related. There were three major facts to remember with nutrition and milk composition. Firstly lactose content remained constant, secondly a change in lactose synthesis caused a change in milk yield and thirdly milk composition only changed if there was a change of protein or fat synthesis relative to lactose synthesis. Fat constitutents were obtained from volatile fatty acids which were affected by ruminal concentration of these, long chain volatile fatty acids which were affected by lipid concentration and adipose tissue which was affected by protein content. Several factors influence volatile fatty acid production in that the minimum ruminal pH was important. If the pH went below 6, acetic and butyric acid levels reduced and proprionic acid level rose and there was low butterfat. The use of frequent feeding rather than twice a day concentrate feeding helped to avoid low pH. Diets with less roughage, or higher total intakes and certain lipid supplements also tended to reduce fat synthesis. The addition of buffers such as sodium bicarbonate or magnesium oxide helped to maintain a high pH and increase fat formation. Large intakes of lipid were however possible, if they were in the form of protected lipids.

The cow did not produce milk of a constant quality during its life, thus the quality tends to fall with increased age and also fat rose towards the end of lactation. As butterfat tended to fall with increasing levels of concentrate feeding some useful rules to follow were that the milk fat level depended on crude fibre and this should be provided at a level of 15% DM, or 2 kg of long fibre per day; a ratio of 70% concentrate to 30% hay was acceptable for 60 D hay, although an increase in dietary protein from 10% to 12% increased milk yield and milk fat and this was only seen at these low levels. The sources of protein and their effects still need more research but generally they appear to have little effect. One or two experiments have shown lactose to have a small influence on fat.

Feeds themselves alter milk composition and quality of forage was important. When answering the question whether silage was better than hay it seemed both would provide a similar milk yield and composition if cut on the same day and both made properly. However, differences occurred because of the times of cutting and this affected the maturity of the crop. Early silage cut in early to mid May was better than late silage cut in June as it produced a higher yield but B.F. and S.N.F. were low. Root crops will increase fat levels if they are depressed. Dried grass had a synergistic effect with silage whereas maize silage with its low fibre content could cause a drop in milk fat. Pre-calving feeding was important in that thin cows had a fall in milk yield and so yield of total S.N.F. and B.F. However, feeding cows well in early lactation set them up for the whole lactation.

Dr. Royce Treacher (Institute for Research on Animal Diseases, Compton) then took a close look at "Recent developments in rationing systems and their effect on milk quality". He continued the theme that milk composition was affected both by the components of the diet and by the way in which they were fed. Oils normally made up about 2-3% DM of typical roughage and 4% of the total daily ration. A major problem in including fat in the diet was that at a level of over 4-5% DM there was a progressive reduction in fibre digestibility by physically coating the diet and thereby reducing acetate production and consequently short and medium chain fatty acids. Fifty per cent of milk fatty acids were synthesized in the udder, between 40 and 45% came indirectly from the diet as medium or long chain fatty acids and about 5% was from adipose tissue. It was the combination of long, medium and short chain fatty acids plus glycerol which produced milk fat.

The depressing effect on dietary fibre digestion could be reduced by adding cations such as calcium. Another method was to produce compound protected chemically or physically from interactions in the rumen. Thus it was possible to protect by emulsifying fat with protein and then spray-drying with formalin. The cow could then digest and absorb fatty acids without ill effect and milk fat can be increased by 30% with intakes of up to 1kg/day of protected fat. The provision of feed little and often helped to improve total DM intake and feed utilization, milk quality and reduced metabolic disease particularly in high yielding cows. Two methods of undertaking this were complete feeding and parlour concentrate feeders. Complete feeding was an intimate mixture of nutrients presented in a form precluding selection and forming the sole source of feed. The feed should be available throughout the 24 hours and there was feeding activity over the whole period, and such a diet consistently increased milk quality including B.F. together with higher body condition scores. Data for out of parlour feeders were very limited but suggested that marginal increases in milk yield could be expected over conventional parlour feeding together with a maintenance or a slight reduction in fat percentage. Direct comparisons between complete diets and out of parlour feeders supported the view that high DM intakes and higher fat percentages occurred on complete diets probably because of higher roughage intakes.

Breeding for milk quality was described by **Dr. Ken Deeble** (A.D.A.S.). There were two methods by which characteristics could be improved, one was to use a different breed and the other was to use superior dams or sires. Cross breeding produced crossbreds which were expected to be mid-parent in performance but there could be a bonus or reduction from hybrid vigour, also financial value of a plus or minus was the justification for cross breeding, although in many cases there was insufficient information on the value of cross breeding. There were also problems as to how best to perpetuate the advantages of cross breeding. It could be done by the new first cross being the end generation or two breed crosses (criss-crossing) or three or more breed rotational crosses. As the results were variable when breeding for milk quality most farmer selected for superior sires and dams within a breed i.e. pure breeding. Some factors had more heritability than others e.g. milk yield 0.35, fat yield 0.44, protein yield 0.48, fat percentage 0.58, protein percentage 0.65, fat and protein yield 0.40. The correlation of fat and protein yield was 92%.

When selecting a bull its Improved Contemporary Comparison (ICC) represented the average genetic merit which it was likely to transmit to its daughters. The reliability of this was the Weighting (W) figure which indicated the number of herds in which his daughters had been milked. The higher the W figure was, the better, and the more even was the spread of daughters over these herds, the better. There were high and beneficial associations between all measures for percentage composition. However, the association between yields and percentage composition was weak and in some cases antagonistic to genetic improvement. Thus the best indicator of a bull's transmitting ability for weight of total solids was the sum of the sum of the ICC figures for weight of fat plus weight of protein in kilograms as these represent a combination of yield of milk and percentage composition.

Many other factors influence milk quality and the majority of these were discussed by **Professor J. O. L. King** (Liverpool Veterinary School) in a talk entitled "The effect of certain anatomical, behavioural, physiological and disease condition on milk quality". He had performed work on the comparison between the milk yield and quality of the four quarters. The quarters in each of the fore and hind pair yielded comparable except when there were clinical or visual abnormalities but the hind quarters yielded more milk. However, in high yielding animals the fore quarters made a greater contribution to the total yield than in low-producing heifers and there were only slight differences in milk composition. Cows with mastitis gave lower fat and S.N.F. percentages than the opposite normal quarters but significant differences only occurred when there were clinical signs of fibrosis. Using milk cell counts to classify the severity of cases the fat and S.N.F., contents were significantly less when the cell counts were over 500,000 per ml.

Observations of the side on which a cow lay showed that in high yielding cows significantly lower percentages occurred on the lain side. When cattle were disturbed by a tuberculin test during the morning or by parties of visitors just before evening milking there was a reduced S.N.F. and protein percentages at the evening milking but the tuberculin test increased and the visitors decreased fat percentages. When cows were very disturbed by visitors their milk was significantly reduced in fat and S.N.F. percentages. At oestrus, milk tended to have a higher fat content and lower S.N.F. and protein contents than post oestrus milk. When cows were weighed weekly those increasing in weight gave increases of S.N.F. percentages and non-significant rises in protein percentages and significantly lowered fat percentages. Animals which lost weight gave significant drops in S.N.F. percentages and non-significant falls in other constituents. When cows suffered from digestive upset, which caused them to eat less concentrates there were significant falls in the fat and S.N.F. percentages. Cows suffering from ketosis yielded milk with significantly reduced S.N.F. percentages and non-significantly lowered fat and protein percentages.

The Tuesday afternoon session was concerned with practice subjects, and began with a talk by **Dr. Brian Wright** (Glasgow University Veterinary School) on "Practicable procedures in the practice laboratory". His paper was aimed at those thinking of starting a veterinary laboratory and gave the basic requirements in accommodation and equipment. Basic equipment included a bench space, incubator, refrigerator, general glassware, etc. Specialized investigation equipment was essential and for bacteriology included petri dishes, loops, antibiotic sensitivity discs, slides and stains. Clinical biochemistry required volumetric glassware, automatic pipettes, etc., and parasitology needed tubes, pipetttes and filter funnels. In bacteriology a useful procedure on obtaining a sample was to undertake macroscopic examination for colour, presence of mucus or pus, smell; microscopically to examine unstained and with Gram-stain, Ziehl Neehlsen and special stains, and to undertake culture techniques. The second day the culture growth could be classed as to colour, size, smell, haemolysis and staining reactions, on microscopic appearance the slope, size, arrangement, motility and staining reaction could be assessed and antibiotic sensitivity tests undertaken.

Clinical chemistry included urine examination which was also visual to look for cloudiness, blood, crystals, bacteria and in urine analysis of casts and crystals could be undertaken and protein looked for with a refractometer. The zinc sulphate turbidity test required a simple colorimeter but most other systems required more complex apparatus and then a Unimeter type system was of use. Some biochemical tests were still, however, too complex and could only be undertaken by special laboratories. Haematology involved either a microhaematocrit or Wintrobe's tube method, and red and white cell counts required a haemocytometer. The error was 10 to 20 percent and could be overcome by use of a Coulter counter but this was very expensive. Stains were required for differential white cell counts and it was possible to obtain stain-coated slides. Parasitology involved both external and internal parasites. Some serology was often beyond the means of the less sophisticated practice laboratory and the same was true of virology. When swabs were taken for virus isolation, they should be kept in transport medium when submitting to a laboratory.

Dr. Trevor Jones (V.I. Centre, Sutton Bonington) described "Nitrate poisoning of ruminants from home grown crops". He said nitrate was absorbed from the soil by plants, and converted into plant protein, but accumulation occurred in plants when uptake was greater than assimilation. Nitrate was converted into lethal nitrite in the rumen. Ruminants could deal with small amounts of nitrite, but in might be rapidly lethal when present in excess. Sub-lethal poisoning might cause animals to abort. The nitrate content of grass might vary markedly at different spots in a field, and cases of poisoning associated with one or two bales of hay had been recorded. Average values for nitrate content of a crop may therefore be misleading.

Mr. Jones described three incidents of nitrate poisoning which had been investigated in the Notts/Leics area. In the first case 9/69 in-calf heifers died and 6 aborted in the course of 5 days on a sewage farm during the drought summer of 1976. Levels of application of sewage had been far in excess of normal agricultural practice, and there was no evidence that sewage sludge was more dangerous than animal manure as a cause of nitrate poisoning. In the second case 4/7 5-month old calves died of nitrate poisoning in the course of half an hour. The source of nitrate in this case was a bale of hay with a content of 2.64% (DM). It was possible that parts of a large field from which the hay had been made had received double application of fertilizer, but the cause of the high nitrate content of the hay was never adequately explained. In the third case 5/100 dairy cows died in the course of 1½ hours, and a further 7 needed treatment. The source of this case was giant rape which contained between 3.60% and 4.04% nitrate (DM) grown on land which had been very heavily stocked for several years, and had received very shallow cultivation.

Although nitrate poisoning from crops is probably very uncommon, if not rare, in this country, Dr. Jones considered that number of incidents of the condition might well become greater with increased intensification.

Dr. Frank Anthony (Bromyard) discussed "Examination and diagnosis in the lame dairy cow". The cost of lameness was £20 million to the dairy industry. He said lameness required a methodical clinical examination of the limb and he was surprised why many students would undertake such an inspection for horses, but when they came to cattle they did not know how to deal with it. The essential equipment included a hand knife, sharpening device, small searcher, hoof shears, hoof testers, local anaesthetic for intravenous and regional anaesthesia, sedative (xylazine), probes and x-ray equipment with 20% sodium iodide. Useful history involved the age of the animal, milk yield, stage of lactation, duration of lameness and treatments already given.

It was essential in the general clinical examination to see the cow walking, was it alert or depressed, resigned or frightened, was there pain on movement or on weightbearing, and was more than one limb affected? Observation from behind was to look for muscle atophy, abduction of limb, uneven weight bearing, and swellings. The foot should be thoroughly cleaned and then look for sand cracks, swellings at coronary band, swelling at the heel or interdigitally. When lifting the foot it should be assessed how easy it was, if no kicking, probably an acute joint infection, if easy but restricted probably a chronic hip, if much kicking then foot involved, and if difficult and collapse - probably bilateral. Close examination of the interdigital space would be for foot-and-mouth disease, foul of the foot, interdigital hyperplasia and puncture wounds, then the heels and coronary band, the sole, the white line were investigated. Pus was looked for and if blood tinged it was a recent puncture, grey/black an older lesion, grey ooze at white line - an abscess, and if thick yellow - it involved the pedal joint. Diagnostic problems included ulceration of the sole, white line abscesses, punctured sole with pus, underrun heel and puncture of interdigital space.

Following tea there was time to look at various poster demonstrations or go to the neighbouring VI Centre where **Dr. Frank Clegg** and his staff had put on demonstrations including lead poisoning and an impressive display of publications produced by the Centre. The poster display was very well supported and included contribution on Daisy - Dairy Information Service by Andrew Stephens (Reading University), the Agricomp computer System by Brian Rawson and Tony Gibbon (Stratford-upon-Avon), Olfactory component of heat detection in cattle and sheep by Mrs. K Stevens (Bristol Veterinary School), Ovarian activity in the post partum beef cow by Andy Peters (MLC), Sperm recovery rate post mortem from the bull by Richard Waters (MMB), Analysis of reproductive problems in post partum cows by means of milk progesterone profiles by Peter Ball (Nottinghom School of Agriculture), The effect of inflammation on Amoxycillin levels in milk by David Watson (Beechams), Milk temperature and oestrous detection (Nottingham School of Agriculture), Practice Laboratory Records (BCL Veterinary Division), Mastitis by Trevor Jones and Herd Records by Nick Giles (Veterinary Investigation Centre, Sutton Bonnington).

An extra item was then presented in response to a request of BCVA members and at very short notice **Dr. Angus Carmichael** (Royal Veterinary College) gave a talk on the proposed RVC/Open University Course for Dairy Farmers and Stockmen. The course was planned for 1982 and would be concerned with the causes and prevention of diseases of dairy cattle. Veterinary surgeons in private practice would take an important part in the training. The Open University system worked by means of many communicational channels. One unit of the Open University course was 10-12 hours' work. It involved educational material, consisting of a correspondence text, a television and radio programme, computer marked test, tutor marked test, tutor groups and self help counselling. There were 40-50 pages of subject material and as distance learning does not allow face to face questions, the text had to be very accurate. This and the rest of the course was based on a programme produced by a course team which included representatives of the Open University, RVC, RVC Continuing Education Unit, ATB, a television producer and a practising veterinary surgeon.

The course would be of 6 sections each taking about 10 hours to complete, including 5 of reading, 1½ hours tutorial, 2 hours assessment, ½ hour's television and ½ hour radio time. It was envisaged that 3000 out of 160,000 in agriculture would be on the course. The television programmes would be mid-morning with evening tutorials. The tutors would help with studying and written assignments and they probably would be based on the 400-500 veterinary surgeons used by the ATB as instructors. There would be 6 presentations over a 3-year period, probably starting on 1st October 1982 with courses from October to December and January to March. These would be repeated in the following three years. The content of the course has yet to be completed and was aimed at farmers who already had the basic skills to carry out practical tasks. The 6 sections were probably to be nutrition and production disease, behaviour in dairy cattle, enteric and respiratory diseases, fertility and infertility, mastitis and emerging and notifiable diseases. It would appear that this meeting was the first at which the course had been discussed with a large group of veterinary surgeons who were likely to become involved as tutors and resulted in much discussion for an against the proposal, and was terminated after three-quarters of an hour. A summary would be impossible but it did seem that two particular areas caused most concern, and these were the course content and renumeration of tutors.

Breeding and bulls formed the topic for the next discussion and **Dr. Ken Deeble** (A.D.A.S.) described "The principles of genetic improvement". Genetic improvement was concerned with defining objectives or traits to be improved, and it was then concerned with the identification of males and females with superior breeding values for these traits and then the use of the animals in the appropriate mating system. Breed improvement was expensive; each AI bull cost about £75,000 and took about 10 years to produce. The appearance of an animal or its performance i.e. its phenotype,was governed by two factors. Firstly, the gene inherited from its parents, i.e. its genotype and secondly "everything else" which includes husbandry, management and disease as well as interactions and associations between heredity and environment. The mating system to use could be inbreeding, outbreeding, crossbreeding, like with like or unlikes. The type of geneaction were additive, dominance and epistasis. The traits produced were qualitative as with hair colour or quantitative as with milk production and conformation. Additive effects were most important to the breeder because they tended to be stable and passed to the next generation. Dominance and epistasis effects are not passed on with such a degree of certainty. Additive effects were expressed as a proportion of the total performance and the resulting fraction was an estimate of heritability h^2. This varied from 0 to 100% inheritance. Most traits of economic inportance lay between these two extremes i.e. milk yield was 25-35%, fat percentage was 65%.

The breeder was concerned with spread of breeding values or distributions. There were four pathways for genetic improvement i.e. bulls which breed the next generation of bulls, the cows which are mothers of the next generation of bulls, the bulls which sire only cows in the next generation and the cows which produce only cows in the next generation. As it was not possible to change the genes in an animal progress could only come from replacing animals by superior ones. Response to selection then depended on selection differential, that is the superiority of selected parents compared with the average of the group, the heritability of the factor involved and the generation interval, that is the average age of parent when progeny to replace them were produced. The rate of improvement depended on the amount of genetic variation, genetic correlations and the number of traits to be improved.

Henry Lewis (Meat and Livestock Commission) then discussed the "Economics of evaluation of beef breed sires". The source of United Kingdom beef a few years ago was about 58% from the dairy herd, 34% from the beef herd and 8% from Irish steers. Any increase in weight gain or stocking density had a marked improvement in returns to the producer. The pedigree breeder was helped in recording by weighing his animals four time s a year and the weights were adjusted to certain ages. This showed the wide variation in weights within a particular breed or even on one farm and allowed the producer to identify those cows doing a good job, as well as providing information on bulls, identifying young stock, both bulls and heifers, and recording management. The weaknesses of pedigree herd recording were small herds, widespread calving periods, different management systems between farms, incomplete records and differences between herds.

In order to overcome some of the problems central bull performance testing helped. This provided information on 400-day weights, feed conversion efficiency, backfat estimates, withers height estimate, breeders' conformation ranking and intermediate weight information. Performance testing was undertaken as a comparison with other members of the same breed kept at the centre under a similar system of management. This showed there was considerable variation within the breed and helped to identify bulls of good genetic merit. The best within a breed went into the Young Bull Proving Schemes where semen was collected and insemination undertaken in other breeders' herds. This provided some progeny test information. Another important factor being examined was calving difficulty and mortality and this varied from bull to bull as well as between breeds. Breed evaluation units were concerned with examining differences between the beef breeds when crossed into Friesian or suckler cows. These animals were fed identically but there were considerable differences in the end weight, age at slaughter, and daily live-weight gain. There was some difference in killing out percentage, percentage saleable meat, weight of saleable meat and high priced cuts, but very little difference in feed conversion efficiency.

"The use of bulls in beef production" was described by **Dr. David Allen** (MLC). He pointed out that bull beef was little used in Britain. However, on the continent 50% of beef in West Germany was from bulls whereas 50% of British meat was from steers. When bulls were compared with steers they grew faster, used feed more efficiently, produced leaner carcases, had more determined behavior and some carcases showed dark cutting. In other countries, including New Zealand, bulls were reared out of doors. However, in Britain, because of safety requirements including high perimeter fences, etc and safeguards for ramblers, no bulls were at present being reared outside. Consequently all bull beef was being produced indoors on intensive systems, usually using Friesian or Charolais x Friesian animals but occasionally Blonde d'Aquitaine x Friesian or Limousin x Friesian. It amounted to about 2% of British beef production. The cost of intensive beef was high and to reduce costs some producers had turned to maize silage which allowed bulls to be finished at a later age and heavier weight.

Besides intensive beef some production was being undertaken with suckler cows. The main advantage of the system was not to the farmer producing the calves but to the finisher as it was in the later stages that weight gain and feed conversion efficiency were markedly better than in steers. The problem with the system was stopping accidental matings with the suckler cows or the contemporary heifers.

This was successfully overcome in pedigree breeding herds; however commercial suckler herds had, for the most part been unwilling to venture into bull rearing. The carcase of the bull had 5% extra meat and 5% less fat than a steer slaughtered at the same weight. Although there was crest development in the bull, making the fore quarters heavier, the amount of meat in the high priced regions, i.e. hind quarters, is still the same as in the steer. Dark cutting of meat was a problem but had now been almost overcome by ensuring that bulls are grouped some time prior to transport, taken quickly to the slaughterhouse, and killed straightaway.

The recent EEC deliberations on the use of anabolic steroids in meat animals made **Professor Eric Lamming's** (Nottingham School of Agriculture) talk "A review of anabolic steroids in cattle" very topical. He suggested it was likely that the veterinary surgeon might become the ombudsman between producers and consumers. In Britain consumers were protected by the Medicines Act of 1968 which was concerned with safety and efficacy of drugs. No such protection was present in some European countries. Despite stilbene derivations being banned, they were illegally imported from Eastern Europe into France where they were injected into veal animals slaughtered for the home market but the neck regions where the injections were made were exported to Italy and ended up in baby food where it caused injury to babies. This had caused consumer resistance and had resulted in the EEC calling for a ban on the use of such products. The legislation in its present form was opposed by Britain with some support from Ireland and variable support from Germany and Belgium. Britain preferred the possibility of a negative list of banned substances which would then allow the registration of products under national legislation. The Commission had not listened to scientific argument on the use of growth promoters.

In Britain twenty years ago a joint ARC/MRC Committee looked at stilbenes for growth promotion. They came to the conclusion that there was a possible slight risk from diethylstilboestrol (DES) but that hexoestrol implants gave a good effect and were many times less active in the human. The use of hexoestrol in poultry for caponisation had gradually declined but it was still used in cattle. In the USA, DES had recently been banned following the discovery that the daughters of women who had received large does of DES therapeutically in early pregnancy, developed vaginal cancer. Thus it seemed that DES was the most dangerous compound for man; hexoestrol had been less extensively tested but work based in Russia had shown it to be slightly carcinogenic. It was obviously legitimate for consumer interests to raise the question of safety. However, it should be remembered that our own meat production was very different from that of much of the continent where meat often came from bulls and much veal was eaten.

It seemed that some compounds should be allowed which were the same or similar to the natural hormones and were biodegradable, which did not, nor did their metabolic products, have harmful effects and which were not active orally. Oestrogenic compounds of this type included oestradiol 17β and zearanol, a micro-estrogen; progestagenic compounds included progesterone and androgenic compounds included testosterone, testosterone proprionate and trenbolone acetate. Comparison of growth promotion with these compounds showed that they all increased growth and it was better when more intensive feeding was undertaken. Residues occurred but oestradiol 17β in implanted veal calves was, at its maximum, three to four times less than in a pregnant cow, similarly progesterone levels in implanted animals were over 30 times less than in a pregnant cow and testosterone levels were a quarter of those in a bull.

"Infectious bovine kerato-conjunctivitis, diagnosis and control" was described by **Mrs. Katrine Bazeley** (Bristol Veterinary School). IBK was the most important bovine eye condition, it caused economic loss as cattle did not grow and it was expensive to handle and treat animals. It was first described in 1898. Recently it gave rise to correspondence which suggested that there was a changing pattern of disease, a reduced response to treatment, and a reduced resistance post infection either by alteration of strains or increased cattle movement. The causes of clinical cases depended on the presence of pathogens e.g. bacteria expecially *Moraxella bovis*, and thelazia; environmental factors, e.g. dust, long grass, ultra violet light, flies; and failure of normal defence mechanisms such as tears, corneal epithelial repair, and cellular defence. Signs of disease were lachrymation with a central corneal opacity which became more diffuse with or without ulceration and this led to inflammation, vascularisation and healing. Why the lesion occurred at the centre of the cornea led to several theories, including that the oldest cells tended to be at the centre and so were more susceptible, as the area was convex the layers were thinner at that point, it was most vulnerable to damage or ultra violet light and exposure was greatest at the centre.

Pathogenesis of IBK could be because of invasion and destruction of cells or production of toxin. *Moraxella bovis* produced two types of toxin, one a haemolysin and the other a dermonecrotic factor. Immunity was both systemic and local. Tears contained IgA produced locally; IgG selectively transported from serum which enhanced phagocytosis and activates complement and IgM probably selectively transported from serum, a larger polymer and concerned in agglutination and cytolysis. Control was to eliminate predisposing factors e.g. fly repellents, isolation inside, more trough space, do not mix age groups; eliminate infectious cows, early treatment or prophylactic treatment with antibiotics, corticosteroids or sulphadimidine; increase general resistance - not at present feasible; vaccination - systemic vaccines are used in America with repeated intramuscular injections but were of limited value, possibly because local immunity was more important than systemic. A prophylactic furazolidine eye spray had been used and will prevent IBK but it needed to be repeated weekly.

Dr. Norman Johnson (Woodplumpton) discussed "IBR in dairy herds" as it appeared in his four-man, 90% large animal practice in North West Lancashire which dealt with about 200 dairy herds with an average size of 50 cows and none over 200. IBR was recognized clinically in 1975-76 and seroligically since October 1976. Outbreaks all had a low mortality less than 1%, variable morbidity and about 20 were seen annually by the practice. Only three serious outbreaks were seen in 6-7 years and these had a high proportion of cows showing signs with milk yield depressed, some deaths, some abortion and infertility. Recently the pattern was changing to less severe outbreaks. The signs were of a persistent pyrexia more than 105°F for 3 to 7 days, inappetance varying from total to selective feeding, milk yield depressed to about half, nasal discharge, drooling of saliva, and some had a cough, diarrhea, very little conjunctivitis, with abortion and in some cases infertility. Diagnosis was on clinical signs, paired sera, nasal and ocular swabs and abortion material.

Regarding antibiotic therapy Dr. Johnson said "don't". This was because the temperature remained high with their use as in most cases the infection was uncomplicated, he considered people were over concerned about pyrexia and if concerned with secondary invaders it was probably better to use tylosin rather than the penicillin and streptomycin usually used. The only exceptions to the rule were in very early cases where oxytetracycline within 36 hours did work. Of the other drugs corticosteroids were contra-indicated, bronchodilators and mucolytics could be used, multivitamin injections were the politics of desperation, and isolation was of little use as other cattle would already be incubating the disease. Control was to improve the environment by turning animals out to grass. Dr. Johnson had no experience with vaccination because since the vaccine became available he had not seen serious disease; the vaccine produced seropositive titres and many of the clients were pedigree breeders and in many herds there was now a good herd immunity. The reason why disease was so mild in his practice could have been that most herds were self contained, the average herd age was high, herd size was low reducing infection rate, the disease was uncomplicated viral infection and immunity was present in many of the herds.

Discussing "Meat inspection from farm practice" **Dr. Andrew Hutcheson** (Longridge) wondered if most practitioners did not enjoy it as they thought it to be a "dead end job". In his practice they became involved as there was a reduction in the rate of Ministry work, a reduction in the number of farm visits, a reduction in routine farm work and the opportunity to become involved in abattoir work occurred at the right time. The disadvantages of the work were duties at the abattoir involved long hours - 11-12 hours from May to December, it was tedious and there was much paper work, there was conflict between the environmental health officer and the LVI's, the VI had little authority, and although undergraduate training for red meat involvement was satisfactory at a general level, it was not satisfactory regarding the routine working and hygiene of abattoirs. There were, however, many advantages; on a personal level it allowed self improvement by familiarizing oneself with anatomy, pathology, parasitology; it improved one's clinical expertise in fertility work as well as improving clinical judgement. It allowed contact with other professions and bodies such as the EHO, AMI, etc., it also meant that the practitioner saw the managment/shop floor relationship, something which in his general duties he would not appreciate. The practice was helped by the profitability - low overheads, little equipment and it allowed more veterinary surgeons to be employed. It also helped in practice organization as hours were regular and the seasonal workload fitted well because the abattoir worked only three to four hour from January to May. Meat inspection helped the veterinary profession as it allowed the practitioners to visit the abattoir. Dr. Hutcheson wondered how many veterinary surgeons visited abattoirs - if so was it because of professional involvement or genuine interest, if not was it because they were too busy and so had no time to visit, or were they just not interested?

Turning to casualty slaughter work, he wondered if some practitioners knew the difference between a knacker and a slaughterhouse. He suggested that charges should be made for the visit and examination of an animal for casualty slaughter, but not for the certificate. There was also a variable interpretation as to the meaning of a casualty or emergency slaughter animal - it was up to the meat inspector to decide if a veterinary certificate was necessary. Turning to the certificate itself, many were very badly worded. In addition to the required details, Dr. Hutcheson suggested the certificate should indicate the nature of the disease or injury, the date of expiry and the maximum distance the animal could travel. Finally, the use of the abattoir to provide information was considered most useful and under-used but he outlined the problems to be overcome before any scheme could be undertaken. These included areas due to sample available, movement of animals between owners, identification of animals, consistent inspection standards and nomenclature, what data were to be collected and confidentiality.

This last paper was followed by vigorous discussion and this had been typical throughout the whole meeting, showing the quality of contents and speakers to the programme. Such vitality not only indicates the good work of our Programme Secretary, Dr. David Weaver, but the energy and enthusiasm of members of the BCVA.

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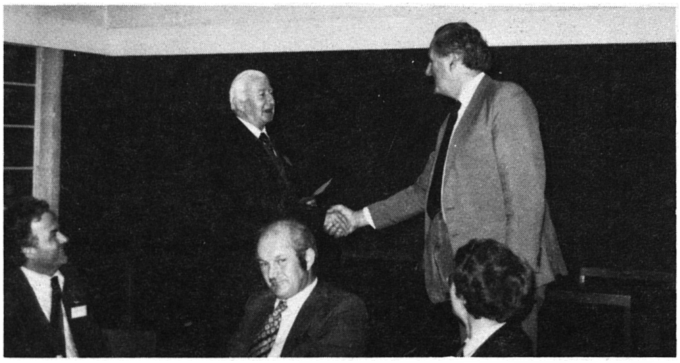

Photo 1 Roger Ewbank (right) receives The Peter Bridge Award for the best paper presented at a British Cattle Veterinary Association meeting from Professor J O L King, President of the Royal College of Veterinary Surgeons.

Photo 2 A lighthearted moment with Ian Baker (left), Mrs. Katrine Bazeley and Bob Plenderleith.

British Cattle Veterinary Association Officers

At the Annual General Meeting of the British Cattle Veterinary Association held at the Nottingham School of Agriculture, Sutton Bonington, near Loughborough, Leicestershire on Wednesday, 15th April 1981, the following officers were elected:

President: D. A. K. Thornton, BVetMed FRCVS
Senior Vice President: A. H. Andrews, BVetMed PhD MRCVS
Junior Vice President: C. Davis BVM & S MRCVS
Honorary Secretary: A. Richardson BVetMed PhD MRCVS
Honorary Treasurer: I. D. Baker BVSc MRCVS
Programme Secretary: W. T. R. Grimshaw BVM & S MRCVS
Honorary Public Relations Officer: A. H. Andrews BVetMed PhD MRCVS

Photo 3 Tony Andrews delivers the Presidential Address at the British Cattle Veterinary Association's Award Dinner.