Progressive farming system—dairy farming—foreign system

by E. ULDALL-EKMAN

IN WESTERN EUROPE and in North America the production of animal food from cattle forms a natural basis of the nation's food, where approximately 1,000 to 1,500 calories, or half of the daily food intake per individual consists of meat, milk, cheese, butter, and other manufactured milk products. The cow's production is remarkable for its specially favourable nutritional construction of the composition of the protein amino acid composition, the range of minerals as well as the fat, sugar, carotene and vitamins in the milk product. To maintain the nation's food in balance, the approximately 250 million people of Western Europe need approximately 25 million dairy cows (10 persons per dairy cow). At the same time, the cow is the most important converter of natural and cultivated pastures, which constitute approximately 50 per cent of total agricultural holdings. The cow is thus the instrument of the preservation of nature as well as maintaining an excellent natural circulatory system for the human being.

The marked drift from the land during the last 15 years has brought unfavourable conditions, both with regard to the work and the financing of traditional cattle-keeping, and many farms have already given up cattle breeding. Within the next two to three years Europe will have to face a situation in some areas where cattle-keeping will be reduced to far below the balance point.

Dairy-cattle enterprises, systematically built up, are one of the counter moves, which can be used against this threat to the industry and today there are large-scale operating units working effectively in France, Italy, Germany and England, as well as in other countries. Several of these enterprises are working with complete industrial methodology, but it must always be remembered that the cow as a biological instrument has to be adapted to surroundings which do not go against the laws of nature. The enterprise must function systematically, both biologically and technically, with regard to its management in order to give a good financial result, i.e., the buildings, the technique and the animal production system must achieve together the appropriate "environmental balance".

Effective production is based on:

1. good adjustment with regard to capital;
2. good adjustment with regard to efforts put into the work.

Normally a routine during the whole year is a general condition for dairy-cattle on a large-scale operation, and the work with the organic basic materials, such as the earth, the plants, the manure and fertilisers, as well as the genetical problems for the biologically producing industry cows, give the enterprise a special character.

The cowtel system

Diagram I summarises the main working components in a dairy-cattle enterprise.

1. Covers the production of fodder in direct contact with the cow routine.

3. Indicates the field production with its type of soil, crop, fertilisation, machinery, harvesting, preservation techniques and the work consumption, all adjusted to financial profitability in accordance with the size of the yield per hectare. The final result will figure as price balance per kilo dry matters, which are sold to the dairy enterprise.

4. Comprises the whole-year cow-house itself, with its technical equipment adjusted to the type of cattle, the production level, the working conditions and the control with the indicated results. Circle 2 contains everything with regard to calves and young animals (additions and bulls) and the points 5, 6 and 7 could each quite naturally form a special enterprise. Plan I. can suitably be called the conception basis, and with regard to each new establishment should be carefully studied and calculated, before building work is started.

It is fundamental, for understanding the conception of a large-scale enterprise, to take into consideration the dairy cow's strongly positive reaction to:

1. the right feeding;
2. the correct milking, and
3. an effective life rhythm routine.

The production of roughage

For the production of roughages—grass, maize, etc.—the land, depending on the quality of the soil and climatic conditions, will be able to cover two to three or four dairy cows/year. It must be calcu-

lated with between 3,000 and 4,000 kilos dry matter per cow/year. A yield per hectare of 10,000 kilos dry matter is obtainable on most of the soils, when sufficient N-fertilisation (200 to 300 kilos/ha) and a balance of P and K fertilisers are used. Milch-cows prefer grass crops with a maximum of Ca/P in the ratio of 3:1 and preferably with a good supplement of sugar contents. The grass crops, such as rye grass or timothy are preferred, partly in view of their easier ensilage conditions and partly due to their composition of minerals. The crops should be cut for harvesting just before flowering, where they have a fibre content of 25 to 30 per cent and raw proteins of approximately 14 per cent.

When ensiling, the crops are cut short and are brought as quickly as possible after one day of predrying to the ensilage. Speed and large quantities per day give the most secure ensilage results, with the formation of high contents of lactic acid (3 to 5 per cent of the material) and contents of acetic acid from 1.5 to 2 per cent. Both acids are extremely important for the feeding of ruminants. The ready ensilage with regard to grass should be of 24 to 28 per cent dry matter or somewhat more. When operating on a large-scale basis it will be necessary to use machines which can handle 20 to 25 tons of green material per hour. The transport vehicles should have a volume of 8 to 10 tons in order to accelerate the ensiling process to 250 to 300 tons/day. The ensilage of maize can take place at a more moderate speed, as the high sugar contents and the normally relatively dry green materials give a suitable ensilage preservation.

In most of Europe grass and maize can with advantage be produced for roughage, and the milch-cows react favourably to 50 per cent of each of the crops with a total of 10 to 12 kilos dry matter/day. The price of the roughage will normally amount to 30 to 50 per cent of the price of concentrates and therefore plays an important part in the economy of cattle-keeping in Europe.

A good analysis of ensiled grass should show: 25 to 28 per cent dry matter, pH approximately 4 to 4.5, 25 to 30 per cent fibre, 12 to 15 per cent crude protein, 1.5 to 2 per cent sand, 2:1 for the Ca/P ratio, 2 to 4 per cent sugar, 4 to 5 per cent lactic acid and 2 per cent acetic acid, 100 to 300 mg/kg dry matter of carotene. The crops can be used for feeding after a time of ensilage of around three weeks.

The cow routine in the cow-house system:

The systematic conception for the dairy unit is based on grouping of the animals in accordance with the lactation curves: A, B, C and D. The animals spend approximately 100 days in each of the A, B and C departments after calving and then spend 60 to 70 days in the drying off group D. This grouping ensures a more exact system of feeding, milking and observation of the individual groups, all under consideration of the special need of the group as an instrument in maximum potential production. It can be regarded as a quarterly rhythm of the life of the milch-cows, which in short can be expressed by:

A = development of potential (100 days);
B = exploitation of potential (100 days);
C and D = recovery from lactation and preparation for the next (100 + 60 days).

The grouping does not only give the possibility of the correct composition of the feeding for the given average output, which can activate the A group to reach the maximum milk output, or the B group to establish production, but it also opens up the possibilities of the correct prophylactic service-work for the staff in the cow-house and for the veterinary services, as well as giving a good control with regard to the gestation control. The animals' environments are completely different in the A, B, C and D groups, which can be seen from the quarter index rhythm given in the table on page 8). Here one finds the groups: milk/day, in per cent of the total lactation, dry matter material/cow/day, the absorption of fibre, the absorption of minerals, the resting periods, the optimal temperatures for production, the absorption of water, the total space need/cow in the buildings, fertilisation quantities cow/day, the rumination frequencies/minute, the working time during milking. Several other aspects could be inserted, such as the frequency of illness in the individual groups.

The grouping is a possibility in the larger dairy enterprises, where the individual groups can reach sizes from 70 to 120 head. It must be remembered that the cow belongs to the herd animals' form of life and a "herd" of 40 animals is in psychological respect too small, i.e. that when a regrouping takes place there will be unrest for a longer period of time. In modern dairy systems of the future, with between 300 and 1,000 cows in the enterprise, one will no longer discuss the problem in relation to "the cow" but express oneself in the A, B, C or D cow.

This grouping in a large-scale operation means that, with regard to the staff, it is possible to build up specialised tasks, which may lead to considerably better executed work, such as milking, feeding, observation of gestation and heat, etc., and the enterprise's working effectiveness thereby gains in efficiency. The basic concept and policy with regard to the working of the cow-house must be well known to the staff, as well as to the management and the veterinary services, and well organised with regard to communication, so that any problems can be taken care of quickly and effectively, based on the basic concept for the dairy unit. The staff in the large dairy unit will need to rely more on their

powers of observation and quick communication than heavy manual labour.

The erection of the dairy building for milch-cows in the free range grazing system, with a place for resting with straw bedding or covered with sawdust, the feeding place covered with concrete and with automatic scraping out of the manure and a 14 metre long mutual manger as well as an open cemented yard for exercising, make up the standard requirement with regard to the animals. A centrally situated milking building contains a Rototandem or a Rotolactor with a quick treatment of the milking and with a milk cooling technique and storage in tanks/vats. To avoid disturbing the cows, and for veterinary reasons, the storage of fodder and the mixing plant are normally situated at a distance of 20 to 40 metres from the animal area.

The allocation of fodder

Only in exceptional cases are the forages composed of ideal feeding stuffs, as the feed cost aspect must be a major consideration in the total enterprise. This does not mean that an advantageous composition of the fodder for the cows' digestive organs is neglected, but one has often to accept a compromise fodder composition in order to cover the needs. An important arrangement, when feeding in modern form, is the total mixing of roughage, concentrates and minerals in one "mix", which is adjusted to the group's needs for the output and for its life.

A solid basis for the large dairy system can normally always be achieved, if the total allocation of fodder can be maintained at 50 per cent or less of the milk price, including the sale of calves.

The fodder should be distributed to the respective cow groups twice a day immediately after the cows have gone to the milk assembling place. The aim is that the first cows, which come back from the milking, can eat without crowding. With a good concentrated and attractive fodder the time of eating will be from 20 to 25 minutes, after which the cow will drink its water ration and go to the place for resting. Specially in the A group this eating at a fixed time is of the greatest importance in order that the cows, which during the first four to six weeks after calving are somewhat weak with a very noticeable poor appetite, may select and take in the food ration. A well organised feeding routine with a good fodder mixture gives, with practice, a maximum fodder absorption per animal, even with 25 to 35cm manger space (the traditional space is of approximately 60 to 80cm). The concentrated manger is easier to service with automatic distribution and the compact mass of the feeding stuff is better protected against tainting during the five to eight hours during which the fodder is lying there in mixed condition. The animals' full freedom in this fodder allocation rhythm gives the cows with large outputs ample opportunity for individually selecting the fodder-value composition which suits exactly the cow's production and needs.

When preparing the feed in the mixing plant the aim should be to prepare it three to four hours before the fixed time for the feeding so that it is lying ready in the "dumpbox", which can contain 10 to 12 tons. Accidents during the collection of the fodder from the silos, such as machines breaking down, electricity stoppages, etc. can be catered for in this system of pre-preparation so that the normal fixed time of the feeding can be maintained. With a fully established automatic feeding system one man can feed from 800 to 1,500 cows per day—with individual rations for from four to 10 groups.

Formulation of the ration is controlled and calculated each week by the management and the more constant the feeding plan can be maintained the easier it is to analyse and control the fodder. No more than two to three slight changes should be made per year in the large scale dairy unit. And, if changes are necessary, then one should maintain 60 to 70 per cent of the basic fodder, in order not to cause too great environmental changes for the cows' stomach flora conditions.

The composition of the fodder should be well composed taking account of: the balance in the total fodder's kilo material (40 to 60 kg/cow/day), the total dry matter/cow, the total fodder price/cow, the raw protein balance from 12 to 16 per cent, the fibre balance from 23 to 35 per cent, the sugar contents of approximately 4 per cent, the fat contents of approximately 5 per cent, the total sand/cow/day of approximately 200 to 300 gr. Also the minerals must be balanced with regard to Ca, P, Na, Cl, Mg, K and S. Here the Ca/P relation is important (1.3/1) and with sufficient Na. The microminerals, which are indicated in mgr/cow/day are to be balanced with regard to Mn, Fe, Z, Cu, Jo, Al, etc. The whole mineral composition of the diet is of the utmost importance in order to maintain the frequency with regard to illness and the gestation periods in order. Also the eventual allocation of acids in the form of lactic acid and acetic acid from the silage should be watched. They can be estimated, perhaps if adjusting the propionic acid as well as alcohol to give a cow accumulated lactation powers. The vitamins A, D_3 and E, expressed in international units, should be balanced with the fodder, the physical structure of which—i.e. the suitable coarseness or the length of the cutting of the green material—is of great importance in order to obtain the biggest saliva secretion and best rumen/stomach processing.

A control based on chemical analysis of the complete fodder plan is rather expensive, for which reason as few changes as possible should be made during the year. The composition of the fodder for the individual groups, A, B, C and D, is based on maintenance (average of the cow weight), growing, foster-production and milk production. It would be

valuable to control the growth of the cows two to three times per year (individually) in order to ascertain whether loss or increase are in a harmonic balance during the lactation (constitution control). The weight control will be of value a few days after calving, 120 days after calving and when the lactation stops at approximately 300 days after calving. A well balanced ration, given totally mixed at fixed times each day, adjusted to the respective groups, with a minimum of variations with regard to protein, fibre and total dry matter from day to day, will give us fully healthy cows with a minimum incidence of mastitis, and the cows will be well helped in their life rhythm with eating, watering (temperature 18°C) and resting periods. Only temperatures of more than 25 to 30°C over several days will have influence on the cows' normal rhythm routine.

Quarterly rhythm for Holstein-Canadian Friesian cows:

		GROUPS			
		A	B	C	D
(1)	average milk/day/cow	27-31 kg	18 kg	12-13 kg	0
(2)	% of total lactation	50%	30%	20%	0
(3)	fodder expenses in % of the price of milk	43-45%	50%	60%	100%
(4)	roughage/concentrates %	60/40%	70/30%	80/20%	100/0%
(5)	fodder dry matter/day/cow	21-22 kg	18-19 kg	14-15 kg	9-10 kg
(6)	absorption of fibre/day/cow	22% (4, 2 kg)	25%	29%	35% (5, 1 kg)
(7)	absorption of minerals/day/cow	700-800 gr	400-500 gr	300-350 gr	260-300 gr
(8)	absorption of fodder-time/day	3-5 hours	—	—	2 hours
(9)	total time of resting/day	10-12 hours	9-10 hours	8-9 hours	6-8 hours
(10)	optimal working temperature for the cow	—4 + ÷10°C	5-10°C	5-10°C	8-12°C
(11)	absorption of water/day	60-75 kg	38-55 kg	32-45 kg	20-30 kg
(12)	evaporation of water/cow/day	around 25 kg	—	—	10-12 kg
(13)	inhalation and exhalation air/day/cow	400.000 litres	—	—	250.000 l.
(14)	respiration frequency/minute	25-30	20-25	—	20
(15)	rumination frequency/minute	75-85/minute	—	60-65/minute	45-55/minute
(16)	number of times at manger/day	12-14	—	—	4-5
(17)	total need of space/cow	8 m2	7 m2	6 m2	4, 5 m2
(18)	necessary eating place/cow	28-38 cm	25-30 cm	22-25 cm	18-22 cm
(19)	saliva secretion/day/cow	180 kg	—	—	70-80 kg
(20)	passage of blood in the heart section/day	50.000 kg	—	—	35.000 kg
(21)	energy production in milk/cow/day	21.000 Kcal	13.000 Kcal	9.000 Kcal	—
(22)	ventilation need/cow/hour	200-350 m3	200 m3	200 m3	100-200 m3
(23)	rotation time for tandem (18 boxes)	8, 5 minutes	7, 0 minutes	6 minutes	—
(24)	quantity of manure on place for eating and exercise place/day	around 20 k	—	—	around 12 kg
(25)	total working time per milking	54 seconds	48 seconds	43 seconds	0

N.B. Notes from the Cotel functioning of the A, B, C and D groups 1968/70.
Feeding with mixed fodder (35 to 40% dry matter).

The milking procedure

It is of the greatest importance to a herd of cows, for instance 100 animals, are milked quickly, partly so that the cows can obtain as many hours as possible for the production rhythm, eating and resting, and partly in order to reduce the incidence of mastitis.

This speedy milking can be achieved through advanced arrangement of the milking parlour, with Rotolactor or Rototandem machines, and through these machines' technical construction, such as the vacuum pressure, the pulsation tempo and the division of the strokes. The environment has also an influence on the cows' effective production of milk, which can be achieved through quiet and exact working conditions, the right illumination and no disturbing, rattling or noisy technical operations. With fully mixed feeding individual feeding with concentrates during the milking has been eliminated, and the cow can, therefore, during milking concentrate itself 100 per cent on this process, and will often stand in ruminating condition during this concentration phase: the giving of the milk as quickly as possible. More than 6 kg/minute can be obtained and it will, therefore, be necessary to think of advanced techniques with regard to the transport of the milk (3,000 to 4,000 kg/hour). Many stages of the milking operation can be executed mechanically; for instance the cows' introduction into the milking machine, their exterior washing and half-drying before the machine is put on, the automatic taking off of the machine after a desired over-milking time of 10 to 15 or 20 seconds. In industrialised cowtels it is the aim that the cows give their milk in the course

of three minutes and during a maximum of six to seven minutes. The real manual work is reduced to an observation of the udder and of the teats, the strip control and the application of the machine, which means a working time per milking/cow of 18 to 20 seconds. A cow with altered milk composition, for instance colostrum milk, could have its milk specially selected from the assembling container through impulses from an apparatus, which ascertains changes in the salt composition of the milk with the help of electrical measuring of the resistance. The working operation with roto-machines has shown an important reduction of the stress effects with regard to the staff—and, as a result of this—a good psychological influence on the cow. Overmilking and the massage of the udder are now but reminiscences of the past, when milking was done by hand, and in reality injured the udder's vital interior tissues.

The changing over of the staff for holidays and vacations, has only shown small reactions on the cows' daily production; because manual labour has been reduced it is easier to learn to do the reduced number of operations in a perfect manner. The mechanical functions work exactly in accordance with the routine for which they are intended. The cows are extremely sensitive with regard to changes in treatment, for which reason an important building up of electrical equipment is important for a suitable milking system.

Mastitis, which is generally assumed to originate from the milking machine and which is extremely annoying, and a disturbing factor for the staff and a financial strain for the enterprise, originates from many factors in the dairy environment and the composition of the fodder. It is an effective indicator of the cow's constitutional weakness with regard to the life rhythm. With a good dairy routine it is possible to achieve below 1 per cent mastitis cases (alterations in the milk) per year with herds of 500 to 1,000 dairy cows. As the milking set-up is an important function for the whole dairy enterprise and is used twice a day per animal during the whole of the 365 days in the year, its construction should be of the best possible technical standard and taking the biological disciplines fully into consideration. It is mainly here that the animals receive a "human estimation" in order that everything should go in a biologically correct manner.

The resting section

A dairy cow's resting periods are important for effective milk production. The complete relaxation gives the blood circulation better conditions and much blood circulation is necessary in the udder section in order to produce large outputs, such as 40 to 50 kg milk (approximately 1,200 to 1,500 litres per day of 24 hours). In order to achieve this performance the pumping of the heart must totally per day of 24 hours work with 35,000 to 50,000 litres of circulating blood, which in harmony with the respiration functions with its consumption of 3 to 4 m3 fresh air per day of 24 hours, should keep the blood sufficiently oxidised (partially regulated through the blood's constant pH value of 7.34). Naturally, it means a lot that the air in the dairy is fresh and specially does not go up to the danger figures with regard to CO_2, H_2S and NH_3 concentrations.

One should try to obtain an environment in the dairy's comfortable emplacement (dry), good ventilation—specially with regard to the A group, lack of noise, subdued light, without draughts, with the right temperatures, the necessary space, etc. The cow, being a herd animal, will in groups of approximately 100 quickly harmonise with the society structure and should herein not be disturbed by human intervention. The symbiosis between the animals is of great value in order to avoid stress in their condition, which can be seen from healthy dairy conditions in an enterprise, where heifers having been recently calved very quickly adapt themselves to the life rhythm when they are in contact with the older generation. The animals' lying down, resting positions and getting up operations should be performed completely unimpeded of ill-placed level heights in the floor area or joining and pillar constructions. One to two hours' observation of the animals' form of life and comments to the staff would be appropriate per day in order to obtain indications with regard to the rumination frequency, the respiratory frequency, etc., (prophylactic work) with regard to the individual animal. 'A' cows should, for instance, have a rumination frequency of 75 to 85/minute against the D group's 40 to 45/minute. (Canadian-Friesian cows.) This observation can be used for establishing how many cows in the group have fully normal life-manifestations, how many are in abnormal condition. With regard to the A group there will at the same time be observations with regard to heat and with regard to having these cows inseminated at the right time intervals.

The industrialised cowtel must aim at having a breeding policy, which results in "industry minded cow types", i.e. big, constitutionally strong individuals (600 to 700 kg) with healthy legs and hoofs, well placed udders with strong udder ligaments and a quick milking capacity. The animals should likewise be good converters of roughage with a big appetite (maximum 25 to 30 kg dry matter turnover per day). The genetically right constellation is today open for our generation, as we can obtain bull genetics from all over the world and get the ampoules for insemination by air to the place where they are to be used.

The frequency of illness

The veterinary service work with regard to a cowtel must be of an extended prophylactic kind, so

that all diseases in the herd which may arise are covered; for instance cases of mastitis, birth problems, hoof diseases, heart, respiration and digestion difficulties, problems with the calves and cases of mortality with reasons for these. These should all be distributed among the groups A, B, C and D and indicate this information per month throughout the year. The end results with regard to diseases are indicated as the so called year frequency, but can also be controlled for each individual month. The gestation effect should likewise be recorded systematically, either by the veterinary surgeon or by the specialist carrying out the inseminations. In large dairies many smaller diseases and accidents will be treated by the staff, who can be equipped with strip indicators in order to ascertain that the pH values in the blood and in the urine, the calcium concentration and the sugar content are all in order with regard to the cow in question. The staff must always be considered as the small veterinary service, which gives notice about abnormal things occurring with the individual animal. This veterinary service is of the greatest importance in order to be able to produce an absolutely healthy quality milk.

Capital investment

It will be extremely difficult, due to differing national conditions, to mention anything with regard to the investment funds per cow or the invested capital per man. These need to be calculated in the individual nations' currency, taking taxes, credit possibilities and the size of the writing off as well as the working expenses into consideration. It must be fixed that the effect per man in the dairy routine should be of 400,000 to 500,000 litres milk/year, in order to balance with the big capital investment/cow, which is often lying 10 times higher than the textile and metal industries are calculating per man.

The production basis for a specialised milk-enterprise must reach 5,000 to 6,000 kg milk/cow/year in order to warrant a "net profit" in relation to the capital investment and the management's efforts per cow of £15 to £40/year, but a special effort may often be carried out with advantage in order to have the big tonnages of special quality milk sold at special quality prices.

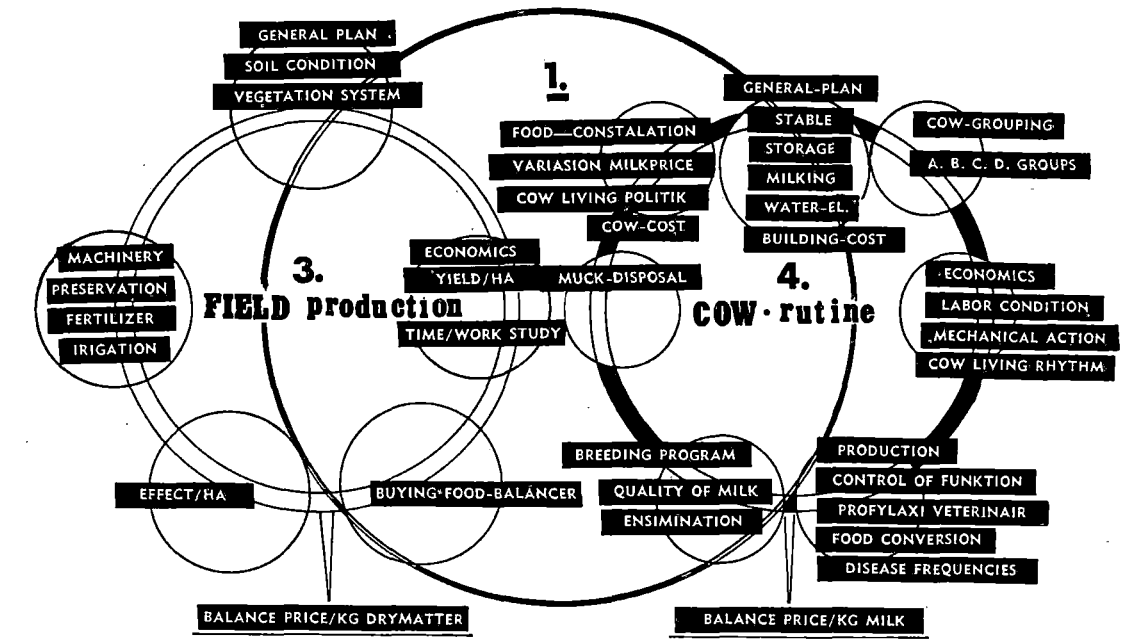
The new systematics with regard to milk enterprises on a large scale, with working methods which are quite different from that of the traditional dairy enterprises, open up possibilities both for young men as well as for women, specially with regard to the milking routine. It is relatively easy to arrange the technical equipment in the cowtel, but to create the right environment and the right working conditions among the staff, necessitates patience, adroitness and a good schooling as far as the management is concerned.

The modern milk enterprise is a big environment installation, where the many instruments and the possibilities regarding teamwork can be compared with a symphony orchestra. Here the management's conducting, vitality and human harmony with understanding of the technique and the biology give as result an interplay for the benefit of the cows' maximum production potential and a fine, relaxed milieu for the staff working in the cowtel.

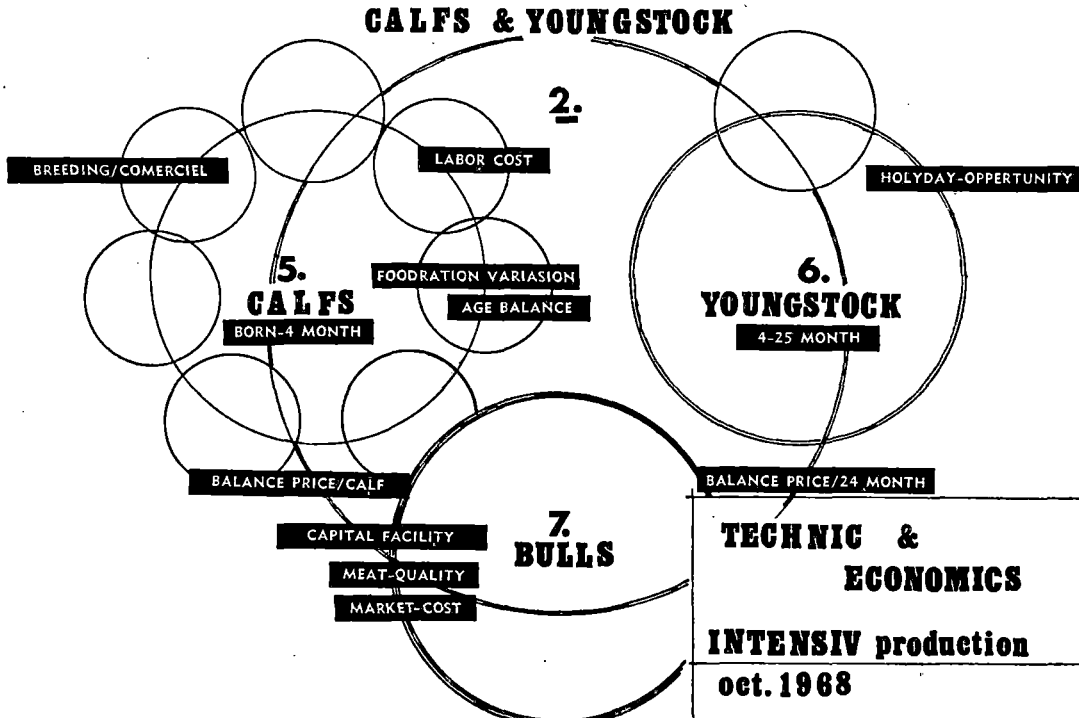
COW-ENTREPRISE-SCHEME

DAIRY-COWS in COTEL

PLAN I



CALFS & YOUNGSTOCK



TECHNIC & ECONOMICS

INTENSIV production

oct. 1968

CONCEPTION

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FOREIGN DAIRY FARMING

DISCUSSION SUMMARY

1. Mr. McDonald (New Zealand), in opening the discussion, agreed that speedy milking was important, but disagreed with the speaker who said that equipment and buildings were the most important part of this. He also felt that labour was the most important part of the routine, and he was unconvinced that the rotary-type parlour was the best system for New Zealand. Their systems were very cheaply built.

2. Mr. Uldall-Ekman was asked about the cost of building his cotels, and answered by saying that he did not like to talk about money, but offered the comparison that four cows and their buildings cost about as much as a tractor.

3. A contributor from France indicated that he had seen some of these large units in France, and stated that they were in a difficult financial situation. He asked the speaker if this was due to technical, financial or marketing problems. In reply the speaker said that there were problems in France, due to high labour costs and relatively low milk prices. He also said it was difficult to ascertain this with certainty because of the reluctance of people to divulge profit figures.

4. Mr. P. James (UK) asked about return on capital. The speaker said that he would expect as much income per cow per year, as it cost per cow, to set up the unit. In terms of profit, the speaker said that in Denmark he would be looking for $50-60 per cow, with double this in the UK.

5. Mr. James came back with his figures and suggested that in Europe, with a yield of 1,500 gallons per cow (indicated by the speaker) the ratio of income/capital invested per cow (in cow and building) would be in the order of 300:650, and pointed out that in the UK the ratio would be in the order of 200:300. On this basis, he could not see how the cotel system could work.

6. Another contributor from the UK pointed out that the cubicle type of housing worked in the UK, and asked what the speaker's experience was in this. He replied that in his experience, the high yields associated with a more traditional lying area could not be obtained in cubicles.

7. Mr. Raffi (Nigeria) observed that dairying appeared to be in decline in some countries, due to capital or labour problems, or simply because cattle were being eaten too quickly; but he wondered whether it was possible to "integrate" in the dairy industry to make it more viable, or was there some other answer? The speaker replied that the balance was swinging more towards beef production, and that this trend would probably put matters right.