

R E P O R T
of
AUSTRALIAN NUFFIELD FARMING SCHOLAR
1976

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CONTENTS

Prologue	Page 1
Why did I apply for the Scholarship?	1
My Farming Operation	2
The United Kingdom Picture	2
Land Ownership and Estate Management	3
The Farmers Organisation - N.F.U.	4
Government Farm Advisory Services	5
Farm Management	7
Farmer Education	7
Dairying	8
Housing	9
Slurry and Muck	10
Breeding, Recording, Mastitis	13
Milking Machines, Sheds and Parlours	14
Dairy Office and Records	15
Pastures	16
Hay and Machinery	18
Silage	19
Maize	21
Milk Marketing Board	22
Beef Cattle	29
Pigs	30
Sheep	30
Arable	31
Farm Shops and Pick Your Own	32
Farm Co-operation and Syndication	33
Flower and Bulb Growing	35
Farmers Clubs and Competitions	36
Conclusions	37
Appendix	

PROLOGUE

The Nuffield Farming Scholarship is awarded annually in Australia for the purpose of giving an Australian Farmer the opportunity to study agriculture pursuits in the United Kingdom, to give also the contact and exchange of ideas with United Kingdom farmers. The Scholarship was originally initiated by the Nuffield Foundation, and funded by them from 1950 to 1975. From 1976 onwards the awards have been funded by the Australian Farming Scholars Association, who have solicited donations from many and varied Australian companies, banks and businesses. It is anticipated that the support that has been forth coming to the Australian Scholars Association will enable the scholarships to be awarded to an Australian farmer for many years to come. When scholars arrive in the United Kingdom their basic and initial arrangements are organised by the Nuffield Scholars Association of the United Kingdom, who give outstanding service and provide superb back up facilities to visiting scholars. There were with me fellow scholars from Australia, New Zealand and Canada.

WHY DID I APPLY FOR THE SCHOLARSHIP?

After hearing the lectures of the last three scholars from Tasmania on their trips to the United Kingdom I decided, "Well if they can win the scholarship why not me?" I have been farming on my own account for some fifteen years. I had become quite interested and involved in our farmers' organisation, the Tasmanian Farmer's Federation, with particular reference to the Dairy Industry Division. I could see that it was not only important to know how to farm, but that one should take an interest in you product after it leaves the farm gate. I thought that this scholarship would give me the opportunity to widen my horizon in both these fields, knowing that I would have an opportunity to utilise knowledge gained.

MY FARMING OPERATION

My farming operation consists of 600 acres of which 350 acres are under grass, the remainder is uncleared forest. I run a 90 Friesian cow dairy unit with followers, supply a manufacturing milk market. I also have a small beef unit of 10 suckler cows and 30 - 40 dairy beef calves, these being sold or finished as season and price allows. I am a seasonal dairy farmer, calving in July and drying off early May. Fodder conservation is both silage and hay. I grow 8 - 10 acres of turnips for winter feed. Labour is supplied by myself with assistance from my wife and family. Silage and hay are made co-operatively with my brothers and father. Over a ten year period my farming area has been increased from 150 to 350 acres by clearing some forest areas, using a contractor to do heavy clearing, and then I ploughed, picked up and sowed to grass. Basic fertiliser used is phosphate with annual dressing of 200 kg to a hectare.

THE UNITED KINGDOM PICTURE

On arriving in the United Kingdom late in February as I did, one's first impression after feeling the cold of English winter is the number of people, cars and urbanisation. Although one tends to become frustrated by the number of people and the shock of having to queue to get anything, whether it be to buy a stamp or to catch a taxi, one comes to realise that this is indeed the one thing that makes the big difference between Agriculture in the United Kingdom and farming as I do in the Southern Hemisphere, and particularly in Tasmania. The difference is in fact that we have 400,000 persons on 26,000 square miles and 6 million acres of agricultural land, whereas, in the United Kingdom, there are 56,000,000 persons on 90,000 square miles with 292 million acres of agricultural land.

In the United Kingdom there is a market for all agricultural produce, with the United Kingdom being 54.6% self-sufficient in total food, and 67% sufficient in indigenous type United Kingdom food. Although the United Kingdom is situated in the latitudes 50°N to 60°N it has a much better climate than its counterparts on the continent.

THE UNITED KINGDOM PICTURE (cont.)

This is because it is an island where no land is further than 70 miles from the sea, and then there is the gulf stream on the west coast that greatly improves the general climate. With a chain of mountains running down the centre of the north of the island this gives the pattern of rainfall. Where there is high rainfall in the south west, west of England, Wales Cumbria and South West Scotland, we find sheep and cattle on the high ground and dairy in the nearby high rainfall areas. We then find that the central south and eastern counties grow grain and other arable crops.

LAND OWNERSHIP AND ESTATE MANAGEMENT

One of the areas that United Kingdom farming differs from the Australian picture, is in the area of land ownership and estate management. In Australia, it is the general rule and practice, that a farmer is the owner and operator of his land. In the United Kingdom we find that land tenure is such, that of the 44 million acres farmed, 18½ million acres are rented. So we see that 40% of the farmers are tenants and pay an annual rental to their landlord. This varies according to the type of land but has been about 2 - 3% of the value of the land. There are, of course, immediate advantages in being a tenant, the most obvious being that there is no capital tied up in land purchase, thus freeing capital for other improvements or working finance. The tenant - landlord situation having been in operation for many years, the limits of liability and responsibility are already well known, and from those visited, a very amicable relationship had been established. The security of tenure is under question at the moment, and it is now pretty certain that if a farmer farms in an acceptable manner his tenure is secure, and so also is the right of his son or heir to continue the tenancy.

The number of tenanted farms is diminishing at this time because of the taxation laws, increased capital transfer tax, gains tax, proposed wealth tax and extra tax on unearned income, that a lot of landlords are taking the land in hand and farming it themselves or in partnership. There has also been a lot of land being bought by institutions and retirement funds as a hedge against inflation, and to reap the capital gain. These types of owners expect a greater capital return than the conventional landlord, so this has increased the land cost to farmers.

LAND OWNERSHIP AND ESTATE MANAGEMENT (cont.)

In conjunction with the landlords we see the necessity of an overall estate planning. On the estates the forestry and amenities are retained and managed as a separate and profitable enterprise. Forestry plays an important role within the estate, particularly with the shooting that it provides. Because of the population pressure on shooting and fishing, it has become an expensive sport with the estates having to employ game keepers and water keepers to manage the particular sports. This, of course, make these sports quite expensive, and in fact, they are out of the reach of most citizens of the country.

THE FARMERS ORGANISATION - NATIONAL FARMERS UNION

One must admire the farmers of the United Kingdom in that they have but one farmers organisation to service the needs of the nations farmers. Born of adversity, the N.F.U. exists for one purpose - to service the collective interests of the agricultural industry, and the individual interests of its members. One soon becomes aware of the unions reputation inside and outside the country, as one of the most effective representational organisations in the United Kingdom. It pursues with vigour its function of representing the farmers at the annual price review.

The union comprises a voluntary membership of 75 - 80% of all farmers from a comprehensive range of agricultures. These farmers are joined in their local branches to 49 county offices. Each county branch send its council delegates (according to number of members) to head office which is in Knightsbridge Road, London. Council delegates then go on standing committees of which there are eighteen. These represent milk, livestock, cereals, parliamentary, legal, general purpose, animal health, economics and taxation etc.. The committees elect a chairman annually and after three years must obtain a 75% vote to continue as chairman. The committee chairman sits on general cabinet.

Finance is by voluntary subscription, consisting of a base fee plus so much per acre with a variation for up-land farmers and horticulture and glasshouse farmers. There are also membership rates for associate memberships and retired farmers. With a budget of around £4 million and a staff 200 - 300, the N.F.U. provides an effective and efficient service to its members.

FARMERS ORGANISATION - NATIONAL FARMERS UNION (cont.)

The N.F.U. also provides a complete insurance service to its members which finances its county and branch secretaries. The benefits of have one farmers organization speaking with one voice to government for the needs of the farmer are quite obvious. Its creditability lies in the fact that the union is able to sort out its problems within the walls of Agriculture House, then speak with once voice with integrity and facts.

Since the United Kingdom has been accepted into the E.E.C., the role that the N.F.U. has to play has been greatly increased, and the N.F.U. has joined the European organisation of farmers, C.O.P.A., where there is one voice speaking for 10,000,000 farmers of six different languages in nine countries. There are now 9.4% of the total workforce in the E.E.C. deriving their living from the land. With this effective farmers organisation, they can and do exert considerable political pressure and so, have obtained a stable and profitable rural industry. What do we learn from this? It is about time the Australian Farmers woke up to themselves, gave up a little independence, changed their basic attitude that "She'll be right mate", and letting someone else worry about our rural industries, and got in and fully support both financially and physically, one comprehensive farmer organisation in Australia.

GOVERNMENT FARM ADVISORY SERVICES

The Ministries scientific professional and technical services are provided by the Agricultural Development and Advisory Service (A.D.A.S.), organised on a standard regional and divisional basis. The service gives free advice to landowners, farmers and growers, but charges are made for certain laboratory and other services such as drainage design work.

Each division is divided into districts where there are A.D.A.S. Officers available to give advice and act as a link between farmers and the professional expertise and farming experience, at the Ministries disposal. Specialist Officers in socio-economics, building and fixed equipment, mechanisation, husbandry, horticulture, farm management, drainage, etc. are situated in the regional or divisional centres.

GOVERNMENT FARM ADVISORY SERVICES (cont.)

A.D.A.S. also operates a chain of experimental farms and horticulture stations representing the main soil types and farming enterprises found in the United Kingdom. Open days are held at each of these stations, annual reports are produced, and visitors are always welcome by appointment.

I was particularly impressed with the husbandry research stations, although their usefulness was in direct relationship to the effectiveness and ability of the director of the particular station. These stations put into practice the latest advice and techniques emanating from the Pure Research Stations. Sometimes the results taught, as was told to me by many farmers, that they were shown what not to do and so in many cases saved the farmers a lot of expense in trying it for themselves.

Another aspect of ministries work is to provide an intelligence collection service, where information on crop reports, field condition, pests, etc. are collected. The information is then disseminated through one of the ministries many publications, or in the event of pest invasion, it would be broadcast over the B.B.C., either as a direct service or through one of the regular Farmers television programmes. We were told that at least 150,000 farmers regularly read a ministry publication. A continual comprehensive statistical information on crops, acreage, agricultural workers, holdings, machinery, horticultural products and stock is maintained.

There are nine regional panels of farmers, landowners and farm workers to act as a direct link in communication, and to assist in advice to, and discussion with the department.

In conclusion one got the impression that although there were some lethargic officers in the ministry, those farmers that required help, be it of general nature or of specialist requirement, was able, if persistent, to obtain all the help required. They have ample facilities available to provide and satisfy the needs of farmers. It was also evident, as in other parts of the world, that there is a small percentage of farmers who are the pace setters and in front of research ideas. Although in many cases the ministry could not say why these farmers were successful, they in time were, and are able to give a scientific reason, and then teach the rest of the farming community. •

FARM MANAGEMENT

Some comment on farm management should be made, as this is an area where I think we could take a lesson. It became quite obvious that the centre of operations on the farm revolved around the farm office, where it was not unusual to find not only the farmer or owner, but the farm manager and perhaps a farm secretary, be she full-time or as was common, a part-time secretary, who came perhaps two half days per week to keep the farm books, records, correspondence and filing up to date.

More emphasis is placed on actual farm management, and it became clear to me that there was a lot of benefit and merit in this sphere of farming. It is a lesson I learnt that less work and more management by the owner is the business like way to approach the farming operation. It has been our custom in the owner-operator farm situation, to manage whilst trying to do the physical work at the same time. This, as was pointed out, gave you a "tunnel vision", a very low and narrow horizon and not enough knowledge and inputs to make satisfactory and profitable decisions. Where you act as the manager - owner this gives time to make valued judgments and complete use of all farm resources. I saw on occasions where owner-managers made more out of valued management decisions than I make in twelve months as an owner-operator.

A high standard of farm record is kept, this being encouraged by the need of the government, via the ministry, for physical and financial records and statistics, that a government grant is paid over each three years period for records kept to a certain standard, this grant being enough to pay a good proportion of the wage of the farm secretary.

It is note worthy that all business is done through the farm office. All visitation to the farm, whether it be salesman, A.D.A.S. advisor, buyers or visitors, is done by appointment, with full expectation that each party keep that appointment on time.

FARMER EDUCATION

There are three basic standards of agricultural education giving a very comprehensive range of all aspects of farming.

The first type is that of the county farm training institutes situated at county level and financed basically by the local county.

FARMER EDUCATION (cont.)

They provide the type of educational facility that provides for farming enterprises of that area. The county college teaches in first year the craftsmanship and basic skills, with the student spending 50% of his time out of the classroom. This course includes proficiency testing on all agricultural crafts, with the standards being set by and also tested by local practising farmers.

Entry to the county colleges is gained after two years practical farming at about eighteen years of age. Should the student decide to do a course in farm management, he then, after the first year in college, spends one year out in the agricultural industry at a prescribed farm, before returning to college in the third year to complete his management course. After successful completion of this sandwich course the student receives a National Certificate which is modified by a national inspector. There is attached to these colleges, farms that reflect the farming activities of the county.

There are then the National Colleges - set up on a regional basis which give the highest National diploma.

And finally, there is the straight university training.

These all give a complete and comprehensive range of rural education, whereby there is opportunity for all who wish, to get training for their chosen career. We need this opportunity in Tasmania. Farmers should realise the need of education for controlled management of their farming enterprise.

DAIRYING

The dairying industry in the United Kingdom is one of the most important of the rural industries, with 3.4 million cows on 60,000 farms, producing 60% of the total milk products requirements for a population of 56 million. Also from the dairy herd comes 54% of the United Kingdom's beef supply.

When discussing the United Kingdom dairy industry, one must realise that the industry is based on the need to supply a gigantic liquid milk market 365 days of the year. 80% of the milk production is used as liquid milk. This means that the industry has to be geared to produce a lot of milk in the "off" season. Farmers are given an incentive to produce out of season by a variation in the price per gallon received.

DAIRYING (cont.)

To produce this continuing supply of milk, farmers must prepare a sound feeding and housing programme to ensure maximum production through winter.

Housing The types of housing for dairy cattle vary throughout the United Kingdom with some of the older areas using the typical cowshed where the cattle are tied in bails, although this type is diminishing in number, but evidence is still to be seen that it was widespread, and that it entailed a lot of labourious work to manage, feed and clean these bails out. Also the milking process where the cows were milked in place and milk carted in buckets to the milk room was slow and inconvenient. And so was the newer method where a milk vacuum line ran right around the bails, and milk returned through lines, sometimes in excess of 100 yards, with the result that milk was nearly churned to butter by the time it reached the milk churns.

The next type of accommodation used mainly in south and west is loose housing, where cows are strawed down in a big barn. Each day fresh straw is added to keep cows clean, and at the end of winter the muck and straw is removed by mechanical loader to muck spreaders, and returned to fields. In my view, the cows under this routine were dirty unless a lot of fresh straw was used. Due to the increased cost of straw and the lack of availability in the past year, great pressure has been put on finding other methods of housing and the system that impressed me most was the cubicle system with or without slatted floor.

In the cubicle system each cow has her own cubicle to lie in. These cubicles are of sufficient size for one cow to lie in so she cannot dung in the cubicle but in the race, the cubicles being on raised platforms and made of some porous material to keep cows relatively dry and warm. The cows that I saw were reasonably clean and dry, the races needed scraping once or twice a day. There seemed to be no real problem to get the cows to sleep in the right place and only a few reluctant ones slept in the race. They were very dirty and deserved their "marching orders". Slatted floors were used in quite a number of farms visited. These seemed to work well provided they had been constructed correctly to handle the slurry from underneath. This then, leads to the biggest problem of all, and that is the slurry and muck problem.

DAIRYING (cont.)

Ventilation of buildings is absolutely necessary for the continued health of the cattle housed, and this is obtained by leaving portions of the eaves open, or slatted walls and open sides. I noted with interest, the building materials used were those that have a long life span. They seemed very permanent and solid and had to be constructed to a very high standard to meet government specifications to attract grants that have been made available on many occasions. These materials included heavy steel beams of iron, pre-stressed concrete beams with tasbestos roofing, and a recent addition in treated timber framing.

Slurry or Muck Arriving in the United Kingdom at the end of winter as I did, visiting dairy farms at this time, my initiation was to see the muck and slurry heaps - either a farmer was proud of his handling system or ashamed of his muck heap, depending on the size of the heap he had. Depending on the type of farm or the system used, so the set up varied. If the farm was dry and it was possible for a slurry tank to cross the fields daily, the vacuum operated slurry tanks would spread it, or on the wetter farms, slurry holding tanks were excavated, or steel tanks built to hold a seasons slurry and this, come spring or summer, was emptied and spread on the field. Muck and straw is also spread at a convenient time by contractors and farm staff onto fields, where it usually is ploughed in as fertiliser. The slurry problem is a very important one and is the initial consideration in establishing a new dairy unit, or when considering enlarging an existing unit. There are stringent laws controlling the effluent from dairies and large penalties for effluent entering streams or water ways. In fact, the limiting factor in herd size is the amount of muck and slurry that can be handled on the property.

Realising that the general climate in the United Kingdom is much colder than Tasmania, a United Kingdom dairy farmer must programme his feeding to allow for six months winter feeding, and at least four months housing.

Depending on the time of calving and whether he is after summer or winter production, or an all year round production, so his feed requirements differ.

DAIRYING (cont.)

The main fodder for dairy cattle during winter is hay and silage plus brewers grains, propriety-feed mix concentrates, or as it is commonly called "cake" plus minerals and vitamins. The basic feed still is hay and 60% of grass is conserved in this manner and the rest is silage, with an increase each year in the amount of silage being made. All silage is analysed after it has cured, and a feeding mix is then made, and quantities calculated to provide for the milker's ration. Sometimes those feeds are milled and mixed on the farm, but usually the bulk is bought from a feed company, it being delivered in bulk and blown into a hopper above the milking parlour ready for bale feeding. For the autumn calves who have reached peak production during winter, brewers grains or rolled barley is fed in troughs during the day.

Cows in the larger herds are usually managed at this time in groups of about 60 cows, graded on production and for time of calving. This allows for different feeding of the groups and milkers claim that it improves milking times through having even batches of cows in the parlour at the one time.

The purchased cake is available in different qualities varying according to the amount of protein and starch. These are then matched to the analysis of silage, barley and other feed stuff available and also to the time of lactation.

Cows in the last four - six weeks of dry period, are steamed up in readiness for their coming lactation, their stomachs are adjusted to receive the type of feed being fed to the milking herd, and in the quantity for maximum production. Farmers are prepared to milk prior to calving to ease pressure on cows, and great care is taken in planning the feed programme that the cows will not have to make any drastic changes in the type of feed.

For the autumn calved herd this is the usual practice for winter production under good management, just as the silage runs out, so the spring growth is available and cows go out to grass. Over a three week period, concentrate feeding is reduced and cows are able to finish their lactation on grass. Under these conditions and reasonable management, I have seen quite a few herds who have produced 1,200 - 1,400 gallons of milk sold, fed on silage and 30 - 40 cwt. of concentrate feed.

DAIRYING (cont.)

When one knows that the United Kingdom's average production is 880 gallons sold, then we realise that there is a big room for improvement in a lot of herds.

With the Spring and late Winter calving herd, the manager is aiming to get the most from his grass. The usual procedure is to winter cows indoor on silage, steam-up with a little grain, feed concentrate for the first 8 - 10 weeks to get the cows to peak production, then to make full use of grass. This is usually fairly successful under good management in a normal year when there are green field right through summer. But the season of 1976, the driest on record for at least 200 years, the summer milk producers have had to resort to feeding concentrates to maintain production.

One spring calved herd I visited milked 240 cows on 280 acres and with 12 cwt. cake per cow, produced 1,100 gallons of milk sold per cow.

In consideration of labour on dairy farms, we have two distinct situations. First we have the one man dairy unit where the dairy farmer milks and manages his own dairy unit with perhaps only help from his wife and family. As the average size of a dairy unit in the United Kingdom is 45 cows, one would expect that the family unit must consist of a lot of small herds up to about 80 cows. We then meet the other set up where employed labour is used to run the dairy unit. Here my observation was that a one man unit with relief milking was 80 - 100 cow herds. 100 - 200 cows generally had 2 milkers with a relief milker. The responsibility of the herdsman is to milk, and feed cows, house and clean, and to cart slurry, calve down, feed calves to one week old, observe heat periods, mating and general health of cows. Milking usually starts at 4.30 a.m. then again at 3.00p.m. with the milker finishing at 5.30p.m., then home for tea. During calving and when cows need feeding, the dairyman checks cows at supper time.

DAIRYING (cont.)

Breeding About 70% of all dairy cows are mated by A.I.. Because cows calving for winter production have to be mated in the middle of winter, which is in fact out of nature's season, farmers must be very particular in maintaining the body weight of the cow to get good conception rates. It also requires good stockmanship to spot cows on heat. United Kingdom dairy farmers use, with great success, breeding charts, either round rotating ones or oblong pin charts. These depict the steaming-up period, expected calving date, actual calving date, expected heat periods, matings and repeat services. This gives the dairyman a great management tool, of particular use in herds where calving is over a long period, and in the herds where there is split calving. The external problem of spotting cows on heat, it tackled in the usual ways visual observation or vesectamizing bull. Heat detectors are attached to back of cows. I noted with interest work being carried out at the Dairy Research Institute at Shinfield, that in observation trials on the mating habits of cows, that the cow on heat performs more activities towards other cattle in the herd than is performed toward her. It is important to note that mounting other than from the rear, mounting (not stationary), positioning behind animals, chin rest and sniffing, the cow on heat performed more. So we see the importance of good stockmanship to get a high presentation for service.

Recording of Production This is done on a monthly basis with a contract milk recorder coming to the dairy to collect the milk sample and weights,, which are sent to a central testing centre where it is tested for protein, fat and S.N.F.

Mastitus A Mastitus cell testing service is provided whereby a farmer takes a sample of milk out of the milk tank and forwards it to a testing station, and the results are returned. M.M.B. do penicillin tests on milk intake and any detection of penicillin in milk, brings a refusal to collect the milk until the farmer proves his milk is clean again.

DAIRYING (cont.)

Mastitus is a continuing problem, with reasonably high cell counts noticed in my travels. I think this problem is accentuated when the cows are housed for six months, as it is very hard to keep them clean and to prevent infection spreading within a herd. All herds visited were teat dipped with an Iodaphor after milking. Dry cow therapy is widely practiced. Those with real problems quickly seek veterinary advice, and tests as to the strain of bacteria and the right antibiotic is quickly done.

I also observed what is called summer mastitus. This attacks dry cows and heifers during summer time, and those farmers who are plagued with this must go round every day to observe the udder of their cattle because unless they are treated within 24 hours then a quarter or perhaps a cow is lost.

Milking Machines When one enters a milking parlour in the United Kingdom, the first thing you notice is the glass jars and the pipes and fittings to connect these to the milk line. Apart from this the machinery is similar to that used in Tasmania. Automatic cluster removers were not an uncommon sight and in the larger dairies were useful and working well. All dairies visited had "in line" or recirculation cleaning. The bulk milk vats usually worked on the principle of an ice bank round the tank, and on many occasions I observed that there were a lot of breakdowns with this type of bulk cooling system. We should be grateful that we have direct cooling on our bulk units in Tasmania. It seems unnecessary to have these glass jars, as they are quite expensive, are breakable, have to be cleaned, need extra pipes and taps, and you have to wait for the milk to be released. So I asked, "Why have them?" The universal answer was, "We like to see the milk coming and what each cow has given each milking." On the credit side they do give better vacuum stability and are useful when recording.

Milking Sheds or Parlours The most common parlour observed on my tour, and seemed to be in universal use, was the herring bone type in many shapes and sizes. These units are available in kit form for fitting into an existing building after modif-

DAIRYING (cont.)

ication, or you can buy the units in two sections, dig a pit, cement the foundations and then bolt the two sections together on the foundation, fit the machine and the unit is ready. Pneumatically operated gates are common place, and tiled milking pit, gives good impression and makes for easier cleaning. All sheds are fitted for bail feeding of concentrates. Holding yards are of varied design and shape, but no problem was observed in getting cows to bail up as there is nearly always food there for them.

On some of the older type farms, there still remains the walk through bail, the tandem bail or the old type byre where the machines go to the cows which are tied up. Of interest too was the mobile, or as sometimes called, the summer bail. This is a mobile unit on wheels which is taken to the paddock and follows the herd around the fields and is driven by tractor or small engine. The milk is collected in churns or large plastic milk tank on a trailer and taken back to a bulk storage tank at the farm buildings. The bail is shifted every 1 or 2 days. Cows now-a-day are controlled and penned with an electric fence, and a new holding pen is made every day or two.

There are some 450 rotary type milking parlours working in the United Kingdom and from casual observation, cows fed into the system well and machinery worked well, but on all units visited the milkers were not happy and did not like working in the rotary unit. The remarks of the dairymen were that a rotary unit was too boring. The units that I visited were milking 300 cows plus.

Dairy Office and Records On visiting a dairy farm and going to the parlour, one invariably is first taken into the dairy office and record room. All dairies visited had this room, and on the wall displayed breeding charts and production graphs and records. The production graph was of daily milk production, being plotted against last years actual production, and also, the number of cows in milk is noted on the graph. Comprehensive breeding records, on a card system for each cow, and on this or in another card file, was a health record of each cow, filled in by the visiting vet.

DAIRYING (cont.)

There we found also cell count figures, quality of milk records, and records of feed programme for cows.

PASTURES

Pastures varied as much as the country does, and from the permanent grasses of the high rainfall areas to the short term leys in the arable areas. It was difficult to find pastures of Tasmanian type where you have a good mixture of grass and clover, with clover supplying the nitrogen requirement of the grass. This is because in the colder climate, the clover is unable to produce nitrogen early enough in the season for the grass to get the early break that is required for early feed. The situation then is found that the usual practice is to supply bagged nitrogen and this is done in varying ways depending on the farmers requirements and own ideas. Varying rates of between 100 units and 350 units of nitrogen per acre was used. In the more arable areas pastures or leys form part of the cropping programme and we find the grass pasture treated as a crop and harvested as such. Whether the grass is removed by animals or taken off as silage or hay, these farmers are able to use the latest varieties that are available, and great emphasis is placed on getting maximum production with the highest digestability. We then find that the tetraploid Italian rye grass is called upon to fulfill this role. In some areas where longer term leys are required the latest perennials, or in some cases a cross between a perennial and Italian, is used. What did particularly strike me as distinct was the attitude, that each variety was sown, to do a particular job. The digestibility, heading dates and sugar content of the different varieties is known, and they are then managed to fulfill their particular role in the farming programme.

On visiting the plant breeding station at Aberystwyth it was particularly pleasing to see the work being done on plant breeding and selection. Over the last years some improved species have been developed that are of high digestibility, high sugar content, of early growth pattern, and particularly acceptable for silage making.

PASTURES (cont.)

Other trials and research at the moment are observation for winter hardiness and the ability to stand up under heavy and continual treading of stock.

A grass that seems to be over looked a lot, but has great potential, is cocksfoot. I found that they had crossed a winter growing, non hardy Portugese diploid cocksfoot, with a winter hardy tetraploid English cocksfoot. This gives an improved winter growing cocksfoot. Also, selected strains of cocksfoot from Spain have been introduced to improve the digestibility of the cocksfoot. Research is also being carried out on strains that can stand and respond to higher quantities of nitrogen, with some plants being able to take up to 600 units per year. Realising the cost in heat units to produce the artificial nitrogen, researchers are selecting and breeding for a strain of clover that can live with reasonable dressings of nitrogen, and so compromise and co-operate in the supply of nitrogen to the grass.

Although there are many ways to ration out or control the livestock on pasture, there is no trouble in the United Kingdom to find all these, with the farmers all satisfied that they are getting the best use of the grass. These systems range from zero grazing to the free range set stocking. I visited some zero grazed herds where the cows had not been out on the grass for 20 years, yet the cows were milking well and seemed quite contented. Under set stocking systems there was maximum use of the grass, and there did not visibly appear to be enough to feed the cows and yet their production was maintained. The paddock system was well used, and observed on many farms, although this gives greater work with fence shifting. Of course, this gave greater control of cows and made it easier to gather them for milking. One fault with the open plan and set stocking system was that it took 20 minutes extra to gather the cows. Still, I suppose a good dog would solve that problem. I did not see many cow dogs at all.

HAY

When it comes to conserving fodder, meadow hay is still the biggest percentage conserved, but is being reduced annually because more farmers are turning to silage making.

Because of the climate, particularly in the high rainfall areas, the farmers have a difficult time field curing hay. In a normal year it is not possible to field cure bales and cart straight into barn. So it is not unusual to see, particularly in Scotland, heaps or rows of bales in the field curing. The procedure is to cut, rake and bale when it is nearly dry then to put it in heaps or rows, cover with plastic, and leave to cure for a week or so depending on the weather, then cart to barn. Another method is to complete the drying in the barn. This is done by building a tunnel in the bales and fitting a mobile fan drier which blows warm air through the stack. This was used on some farms I visited with great success. The drier was used for corn also.

Hay Machinery Mowers were all of the rotary or turbo type and proved very satisfactory. Rakes and tedders were again a of rotary type but seemed to be too vicious for our clover hays. They did though, leave a good fluffy windrow for the balers. Bales were mostly of the small square size, but all balers had an accumulator of one sort or another attached and bales were left in groups, usually of eight bales, these were then handled in the flat eight system or carried two by four in grabs on either loader or 3-point linkage.

Coming into vogue though is the big bale, particularly the big round bale. These work exceptionally well with straw, farming well shaped bales firm and good to handle. The meadow hay required a little more care in making I was told. Provided the farmer equipped himself to handle these bales, it became an efficient and fast operation to get them into the barn. These bales require a different system and type of barn and take up a little more space than the conventional bale, and provided the farmer adapts himself to new techniques of feeding out they are then good, simple and an easy way to feed cattle.

HAY (cont.)

A good deal of research is going on in relation to additives for hay, to prevent mould when it is baled in too damp conditions. The use of proprionic acid and formic acid will prevent mould and preserve hay baled in this conditions. But the problem is to get an efficient and even covering of additive on the grass as it is baled and also to stop the acid having a deteriorating effect on machinery.

SILAGE

Silage now fills about 40% of total grass dry matter conserved in the United Kingdom for animal feed. On farms visited it formed the basis of the winter feeding programme, and depending on the type of stock to be fed, the farmers approach to silage making varied. If it was to feed suckler cows and store cattle, generally the farmer went for quantity and ease of ensiling and the low cost of silage. But where the farmer has to milk cows or fatten cattle and finish them on silage, then the approach was for a highly digestible silage, full of nutrition, with minimal loss of feed potential. When this top quality silage is required the farmer pays particular notice to detail and the latest research findings in silage making. While silage can be made from almost any type of green material, for good quality silage, a young leafy material of high digestibility (D value 65 - 70) is required. To obtain a first class highly desirable silage, planning must begin with sowing the right species of grass, correct fertiliser for maximum growth and production, cutting at optimum time, wilting to correct dry matter content, clean pick up, fine chopping, relative additive used, it must quickly ensiled, rolled and sealed with plastic cover and weighted.

Types and Species of Crop For maximum production and top quality silage, a grass is used that will give a high digestibility under maximum production with high sugar content for efficient fermentation.

Time of Cutting Time of cutting effects the digestibility of material ensiled, and the usual practise is to cut at 50% ear emergence in a one variety crop, otherwise it becomes a compromise.

SILAGE (cont.)

Wilting is widely practiced, and although this puts another operation into the process, it is very advantageous, cuts weight of grass to be carted, reduces effluent from silo, increased dry matter content of silage and saves on additives.

Size of chop too has a big effect on the finished product. The finer the chop the easier it is to consolidate, and mechanically handle. Research also has indicated that the finer the chop the greater the intake and the greater the growth rate. There are four basic machines used to cut and collect. Firstly the simple flail type which cuts and loads and does not chop, secondly the forage waton that picks up wilted grass loads and carts, thirdly the double chop which cuts and chops and loads direct and fourthly the precision chop with pick up and the ability to chop to $\frac{1}{4}$ " lengths and load.

Additives These are quite commonly used as a tool in efficient silage production. Research work studied has shown that green direct cut grass, or wet grass ensiled with an additive, gives the same quality silage as that same grass wilted and properly ensiled. The additive is applied by gravity or under pressure through a nozzle into the cutting chamber of the crop chopper. This gives a reasonable spread throughout the crop. In general practice I observed that about half a gallon of additive per ton was used as an insurance to assist good and even fermentation, but where a green or wet crop was ensiled then one gallon per ton was required and used.

Silo All silos or bunkers seen had concrete floors and either concrete, concrete blocks or old railways sleepers with steel H bars for walls. Where sleepers were used it was generally sealed by nailing up old plastic fertiliser bags which were replaced each season as required. Most bunkers are filled in the Dorset Wedge System..The grass is dumped on concrete at front of bunker then a tractor with a push-off buck rake is used to cart the grass into bunker. The bunkers are filled from the back, and as steeply as practicable. As soon as sufficient area of the required height is reached it is covered with plastic, sealed at edges and weighted.

SILAGE (cont.)

Feeding Silage Two basic systems are used, that of self feeding and mechanical extraction and distribution. The simplest of the two is self feeding and this is done by one electric wire stretched across the face of the silage. This wire is fitted with a spring to save breakage if cow is forced onto it or if a lump of silage falls down on it. This wire then is shifted the required distance each day. If the mechanical system is used the silage is extracted with a grab or loader, placed in forage box and fed in troughs. This system's main advantage is that a closer tab is kept on quantity consumed and it is easier to regulate.

Brewers Grains are much used as bulkfeed for dairy cattle. I noticed that although these are available all the year round, mainly used in the winter time. These therefore are put down in bunkers and sealed with plastic sheet coverings as with silage, and they are well kept till the winter time.

Another interesting way of storing the brewers grains is to put them in the bottom of the silage bunker and then to make silage over the top, so when the silage is fed out, the cows get the grain in the bottom and silage above and clean up silage face well. I consider it to be very practical and saved a lot of handling of the brewers grains.

MAIZE

For some time now I have been interested in maize growing the fact that in Tasmania it is reported that you can get 40 tons of green material per acre of a crop, gave me encouragement to try and grow some, with thought towards making silage and at a much more convenient time of the year. I was able to sow an acre, found it would grow, so my interest was then aroused to find out the right management techniques. With the United Kingdom climate similar in a lot of ways to Tasmania I considered this would be a good place to start.

In the United Kingdom over the last five years a great interest has been shown in maize growing for forage and silage. With the advent of new strains and varieties being developed for cooler climates large acreages are being planted

MAIZE (cont.)

The main uses of maize is for silage and direct feeding. Maize as silage has its limitations and is not as convenient as grass silage. The two main faults as I see it are, firstly, it must be chopped very finely $\frac{3}{8}$ to $\frac{1}{2}$ inch chop length, and the other is that the face of silage must be used at the rate of 5 - 6 inches per day in winter and twice this rate in summer to prevent secondary fermentation. The silage itself is a first class, high energy silage, but is low in protein and must be supplemented with protein for high milk production. Alone, it will maintain a milking cow at $2\frac{1}{2}$ - 3 gallons a day or fatten and finish bullocks for market. Requirements for growing are a fairly deep soil, well worked, ph above 5.5 or lime if below that. Seed is sown at 45,000 seeds per acre, in rows 28" apart and $3\frac{3}{4}$ " between seeds. Fertiliser depends on soil requirements, but a complete fertiliser with 100 units of nitrogen is generally sufficient. A good rainfall or irrigation is required in the period from 50 to 100 days of growth. Weed control is by pre-emergent spray of atrazine at $2\frac{1}{2}$ - 3 pounds per acre. Care must be taken as this spray prohibits growth of any other crop for up to 12 months. Diseases that could effect the growth are stalk rot, smut and stem borers. Maize for silage is best cut when the grain is at the cheesy stage. For the prevention of mould growth when feeding out of clamp, propionic acid can be added at time of cutting.

Planting time is when soil temperature reaches 50°F and stays there. Maize can be grown where the average accumulated temperature is above 10°C is 730°C during the six months growing period, and where there are 2,800 Ontario heat units available in this period.

MILK MARKETING BOARDS

The Milk Marketing Board of the United Kingdom was established by the Agricultural Marketing Act of 1931 and 1933, and was given the responsibility of regulating the marketing of all milk produced. In value terms milk is the

MILK MARKETING BOARD (cont.)

most important single agricultural product of the United Kingdom accounting for £1,000 million or about 20% of the total value of all farm produce. The industry provides 100% of all liquid milk, and 32% of the milk equivalent for home demand of milk products. The nations dairy cow population forms a total herd of 3.38 million, yeilding 11,100 million litres in 1975, which is 400% more than Australia's 2.38 million cows producing 2,876 million litres. Nearly 97% of total production is sold off farms for liquid consumption and manufacture, while the remainder is kept on farms for the use of the farm households and the feeding of stock.

The concept of milk marketing organisations acting on behalf of producers emerged from the experiences of the 1933 era, when the individual and unco-ordinated efforts of dairy farmers to obtain a fair price for their product, and the attempts at voluntary co-operation revealed the weakness of these approaches to the market. The proposed milk marketing scheme was submitted to Parliament for approval, and then a poll of all dairy farmers gave overwhelming support for its establishment.

The board may be discribed as a type of compulsory farmers co-operative. It operates as an independent producers organisation, under the authority of registered milk producers, and within legally constituted powers. A producer offering milk for sale must be registered with the board and registered producers are required to sell milk solely to their board or agency. The Board has a statutory obligation to buy and find a market for all milk offered for sale by registered producers, provided it complies with certain marketing standards of quality.

While the Board has compulsory powers to buy and sell all milk, yet there are checks built into the scheme to safeguard other interests in the industry. There is, for example, a compulsory consultation with the dairy trade and manufacturers interests, through a joint committee with an independent chairman. Should agreement not be reached, appeals may be made in varying stages up to the Minister of Agriculture.

MILK MARKETING BOARD (cont.)

The Board itself consists of elected members, most of whom came from individual regions. Some members come from an election of all producers. Also, three are appointed by the Minister of Agriculture, but once appointed do not report to the Minister. Milk producers vote according to the number of milch cows they own.

Communication between the farmers and the board is an important aspect of the scheme and many channels are used. The country is divided into regions with a board member responsible for each region. Within the region elected members for each county form a committee to report and make representation to the Board and also to advise producers of the effect of board decisions.

Except for the milk entering the boards own transports, creamery or dairy enterprises the board does not physically handle the milk it markets, yet its day-to-day operations involve it in a large number of transactions with producers, hauliers, distributors and manufacturers. It is the boards first priority to satisfy the total liquid requirements, then the other manufacturing process in the order of profitability and requirements.

Payment of Producers The United Kingdom Government fixes the guaranteed price of milk within the maximum laid down by E.E.C.. It is the boards responsibility to implement the guarantee in the actual or provisional monthly producer prices it pays. The monthly prices reflect a seasonal variation and are payable for a specific composition of the milk, with deductions or additional payments being made for milk which is below or above this basic level. The producers price varies according to this composition, in relation to the percentage of butter fat, solids not fat, total solids, and the hygienic quality.

Transport of Milk Daily the milk from 75,000 dairy farms is collected and delivered to its first collection point. About 1/3 of this milk is collected in M.M.B. lorries and the balance by contractors.

MILK MARKETING BOARD (cont.)

Creameries and Dairies M.M.B. owns 20% of the creameries and dairies and produce 30% of the butter and 15% of the cheese in the United Kingdom. Only 5% of liquid milk is distributed by M.M.B..

Marketing As the M.M.B. was set up to be responsible for the organised marketing of the milk, so there is a strong and active marketing and promotion section. It is not only producing a good quality product that is necessary, but the product must stand out in the market place as value for money, and be available to all those who need it and can use it. The board, in conjunction with the Milk Publicity or Dairy Council and dairymen, join forces in presenting milk and its products to the public. The promotional activities are directed through many channels, the main one being television, followed by joint trade promotions, milk selling schemes, increase in outlet milk dispenser and educational activities through school and home. Overall, the board spend £5 1/3 million on advertising which is about .2 pence per gallon of milk sold.

Along side the actual collection and marketing of milk, the board is involved in many other farm production activities. Perhaps the largest of these is the Artificial Insemination Service provided. This service is provided through 115 Service Centres and selection of semen from the boards stud of 1168 bulls can be made. The A.I. service is provided 365 days of the year with trained technicians giving daily service. Most of the bulls for the stud are bred for the board through its contract mating scheme, whereby cows of above merit standard are selected and put in calf by superior bulls. The bulls are then reared and progeny tested for both production ability and confirmation. A central Sire Register is kept at Thames Ditton. There, sire cards are kept for each bull in the stud, on which all information regarding the bull, such as location, progeny test date, insemination numbers, non return rates, abnormalities, ease of calving, etc., is kept.

MILK MARKETING BOARD (cont.)

In conjunction with the A.I. service the board runs a Veterinary Work and Research Centre dealing mainly with the A.I. Bull Stud, semen harvesting and conservation, and with developing A.I. techniques. The programme also includes calf conservation and the maintenance of a healthy breeding cow.

Milk Recording Under the National Milk Recording Scheme (N.M.R.) there is a monthly recording of production of individual cows. A recorder under contract to the Board visits the farm once a month, records the P.M. and A.M. milk yeild, and takes a sample of milk for butterfat and protein testing. Service and calving dates, purchases and disposals are also recorded. The farmer then receives a complete print-out of the herd's production, and automatically, on completion of 305 days lactation, cow record cards are issued. Other information provided is a monthly summary of those cows due to calve, to be served, dried off or pregnancy tested. This N.M.R. scheme is the only recording service acceptable to all cattle breeding organisations and is used by the M.M.B. A.I. herd improvement service.

As an alternative N.M.R. a F.M.R. farm management recording service is provided. This is a do it yourself system, whereby a farmer collects his own information, and using the recording stationery, the farmer is able to work out management efficiency factors. This basic scheme provides for a fieldsman to visit the members farm four times a year to calculate lactational records for each cow and to summarise the herd as a whole. Optional extras are computerised, up dating of weightings taken monthly by the member, and the analysis of milk samples for butterfat and protein if required.

L.C.P. Services The L.C.P. Services of the M.M.B. offer a wide range of costing and consultancy aid to all farmers. The aim is to improve farm efficiency and to help farmers achieve their planning and development objectives through sound business management.

MILK MARKETING BOARD (cont.)

There are two distinct divisions to L.C.P., records and consultancy, and the options for service that are offer to farmers, are made up from basic schemes on each side. Data is collected on tape recorders on the farm, then processed in the office where the information is put onto individual files. This provides a record of the past year and basis for planning the future of the business. The records can be used by farmers consulting officers and the farmers' bank manager. Following on from this data collection and with the L.C.P. consultants, the following services are available:

- (a) Total Farm Business - full physical and financial report
- (b) Farmstate - monthly cash flow analysis and annual report
- (c) Dairy Farm Business - Annual summary and gross margins and dairy herd trading summary
- (d) Dairy Management Scheme - Monthly herd inputs and outputs are recorded by the farmer and analyse by computer, giving margin over concentrates and a rolling 12 monthly average
- (e) Herd Management Control - gives predictions of individual cow and herd output and is used as management tool
- (f) Consultation - this service is bought on a regular basis or on a "one-off" job basis

Mastitis Here the board provides three services for the farmer:

- (a) Cell Count Service - The farmer takes a sample of bulk milk and posts it to the Laboratory where the white blood cells are counted and results returned to the farmer
- (b) Individual Cow Cell Count and Service - samples from individual cows are assessed for white blood cells, and also if required, bacteriological examinations and antibiotic sensitivity tests are carried out

MILK MARKETING BOARD (cont.)

- (c) Mastitis Control Service - The farmer undertakes to operate the full control service which entails a simple 5-point control plan, plus four visits a year from the mastitis technicians, including one at milking time.

Brucellosis The board provides a monthly milk ring test covering all herds, with letters advising the result being sent to the farmers. This enables those farmers who are free to screen for infection, and information to those producers who plan to gain accreditation.

Pregnancy Testing Service This service, based on estimation of progesterone, the hormone of pregnancy, in milk sample, has only recently been introduced. Samples of afternoon milk are taken by the farmer about 24 days after insemination and posted to testing station and the results are returned within five days.

Milking Machine Testing This is an annual service whereby a service technician visits the farm and tests the milking machine for efficiency. He is able to make small adjustments and corrections, but any major faults must be corrected by machinery agents.

Note All services offered to farmers by the M.M.B. are at the cost of providing that service.

BEEF CATTLE AND INDUSTRY

The fact that the United Kingdom is 80% self-sufficient in meat production points to the fact that it is a sizeable industry. The beef herds in the United Kingdom are smaller in size than the dairy herds, but the modern trend is towards larger scale enterprises. The majority of home produced beef is a by-product of the dairy herd, and although the popularity of the Hereford as a crossing bull has been maintained, the Aberdeen Angus has lost ground to the imported continental breeds such as the Charolais and Simmental. 25% of home produced beef calves come from the beef cow population. Most of these suckler cows are cross bred, and increasing use is being made of the beef cross Friesian as the breeding cow. Beef bulls sire two thirds of all calves reared for beef.

BEEF CATTLE AND INDUSTRY (cont.)

There is wide variation in systems of beef production, much of which is still run on traditional lines and as a secondary enterprise on the farm, the trend being towards a more intensive system of production.

The decision a beef producer has to make is, when does he want to finish off his cattle, and will it be off grass or out of the yards.. If the decision is that he will send off young beef off grass, then the breeds are the traditional Hereford and Angus, as these finish earlier and will finish on grass. If the decision is off grass at a greater age, then the British South Devon or Lincoln will do the job. If he decides on the imported breeds of Charolais and Simmental, then while expecting good growth rates, he must be prepared to take longer to finish cattle off, and be prepared to feed grain in the finishing process.

One of the biggest influencing factors in the beef industry is the Statutory body called the Meat and Livestock Commission (M.L.C.). Established in 1967 its involvement in the industry is from conception to consumption. It has to report to Parliament, is financed by the industry through levies on slaughtered animals but otherwise completely independent. The M.L.C. provides marketing and grading of all stock for slaughter, carcase classification and meat promotions through one of its 1,300 Fatstock Officers. Research activities in the meat industry are animal health, natural breeding programmes, commercial systems on breed valuation, on farm beef recording, farm records, consulting service, artificial breeding service and consumer publicity.

A continual role is the M.L.C.'s market surveys that are published weekly, monthly and annually, and the daily phone in service where all market information reaches the M.L.C. by 4.00 p.m. and at 5.15p.m. a market survey is ready for those who require it.

PIGS

With nearly one million breeding sows rearing an average of 16.2 piglets each year, there is quite a sizeable pig industry in the United Kingdom. Production is just one million tonnes of pig meat compared with Australia's production of 1/5 of that amount. The trend in the United Kingdom is toward the larger scale units with 60% of the herds having 50 sows or more, and tending more and more to breed and finish on the one farm. The average food conversion rate is 3.6 pounds feed to 1 pound pig meat.

I only visited 2 or 3 pig farms, one being a fairly large unit with 1,600 sows, 1,200 being run outside on the village system and piglets being weaned at 6 weeks, then housed and fattened. The balance of sows were in closed quarters, individually penned, mated by A.I. and weaned at 3 - 4 weeks. Piglets are then put into hot boxes and fed dry feed ad. lib. till 12 weeks, when they go to fattening pens and are fed by the river method three times a day.

The shape of the pig industry has altered over the last ten years. Earlier, the industry was associated very closely with the dairy industry in the South West area, but now it is concentrated on the arable areas of the east due to the availability of grain. Over the last ten years 100 producers a week have gone out of the industry, yet the total herd size has remained. On the market scene the United Kingdom is 95% self-sufficient in bacon with the balance coming from Denmark.

SHEEP

When one comes to consider the sheep industry one finds that it plays a secondary role in most farming systems, the sheep being used as scavengers to clean up by-products of other crops such as seed stubble. For a comparison of size there are 28½ million sheep in the United Kingdom whereas Australia has 145 million sheep. With only 12% of the sheep in flocks of 1,000 or more and 20% as the main enterprise, one can easily imagine the size of the flocks.

SHEEP (cont.)

From observations that I have made in visiting farms with sheep, the main product and money spinner is the fat lamb for the United Kingdom market and for export to France, these heavy lambs realising a very good price and return to the growers. The wool component only returns 5 - 10% of gross returns so most farmers are after a high lambing rate. I saw an operation where 175% of live lambs was achieved. In this set up the ewes were housed at night and the shepherds were on duty all night. Immediately a ewe lambed, she with her lambs, were transferred to individual pens, where lambs were checked that they were being fed. Navel of the lambs were checked that they were not infected, triplets were broken up and singles doubled up where possible. After 12 hours, lambs and ewes were grouped in clean yards for 24 hours before returning to the fields. There was a big labour component in this system but with each lamb worth £20 at 4 months it was an economic proposition. On the properties visited the handling facilities left much to be desired and were make shift affairs. So also were the shearing shed set ups - temporary units just set up in a building for the shearing season.

There are 40 different breeds of sheep in the United Kingdom and on seeing some of these at the shows, one could find a breed to fit any purpose required. I was fascinated to visit one farm where the owner had costed out his sheep enterprise, and found that he was losing money on the wool, so he had bred his "Easy-care" sheep that do not need shearing. The little wool that does grow, falls off in spring, these were very good fat lamb producers.

ARABLE

One of the things about the United Kingdom farming that surprised me was the amount of grain that is grown and used in the country. Whilst barley has been the main grain crop, wheat is the crop that has increased production over the last year or two. The quantity of grain produced in 1975 equaled that produced in Australia. The common rotation used on the arable farm is two years grass ley, 2 years winter wheat, 1

ARABLE (cont.)

year winter barley with catch crop of rape or turnip, followed by spring barley undersown with grass. The quantity aimed for is at least 2 ton of barley and 3 ton of wheat to the acre.

In talking to the farmers it was obvious that a lot was known about growing grain and that there was a well known recipe for a satisfactory crop. A great deal of research has been going on for new, better, more productive and disease resistant varieties. Very good weed control measures are available although some crops needed more care and attention. Nitrogen was regularly used also pests and disease infestation was monitored and controlled during growth of the crop.

The latest management tool in effective and accurate application of fertiliser and sprays is the use of tramlining. This is effected by the blocking off of two drills in the seeder at wheel width and at appropriate positions across the paddock. These are sited at the effective width of sprayer and fertiliser spreader. In subsequent operations the driver only has to follow these tramlines, giving him an accurate field operation.

When it came to harvesting, the most common machine was the open fronted combine, the grain being carted to farm store by shuttle work of trailers, after being picked up, on the move, from the combines. On reaching storage the grain is weighed either in trailer or over a continuous weigher fitted into the grain handling system. In most seasons it is necessary to dry grain for storage. Subsequently most arable farms have driers and storage capacity for most of their crop. Grain is then held on the farm until sold.

Should the grain be required for feed only and no drier is available, then Propionic Acid is mixed with the grain and there is no storage problem.

FARM SHOPS AND PICK YOUR OWN

Farmers realising the costs involved between the farm and the consumer have decided in many cases to reap this reward for themselves and so we have the advent of farm shops.

FARM SHOPS AND PICK YOUR OWN (cont.)

This, in fact, is a retail outlet on the farm itself, selling the produce of that farm. The secret for this operation to be successful is to supply top quality produce - price is not always the determining factor.

It was an impressive sight to see a 40 acre orchard of top and soft fruit that had been planted out especially for "pick your own". These apples and pears were planted in rows. Weed control is by chemicals. Also strawberries were grown as a cash crop (between the apples) in the first two years of establishment. The apples and pears were all sold, pick your own and went in a few weekends. These fruit trees were grown on dwarfing root stock so that when fully grown were but six feet high, so as to be easily picked.

The only effort required when harvesting is to rope off the sections of the orchard which are to be picked and to have someone to weigh the fruit and collect the cash. The other necessary thing is a good parking area with a pleasant recreational area for the children to play.

FARM CO-OPERATION AND SYNDICATION

Co-operation is used to advantage in many different applications, there being a government agency, the Agricultural Co-operation and Marketing Service, providing expertise, advice and finance for the establishment of farm co-operatives. We talked with directors and management of some trading co-operatives with multi-million pound turnovers. They admitted similar problems to those we have in Australia, where the management is too far removed from the shareholders and clientel, and there is a communication breakdown and then an unfaithfulness to the co-operative and the continued support is not forthcoming. Even so it was quite obvious that the system provided good competition and a service to the farming community.

FARM CO-OPERATION AND SYNDICATION (cont.)

Co-operative selling of farm produce, be it livestock, potatoes, bulbs or other produce was, in those inspected, an advantage to all concerned. The potato marketing co-operative I visited was where growers combined to make a storage shed, and packing operation, where they sold potatoes right through the year. Another operation was where farmers supplied the land and the co-operative did all the work, from cultivation to selling. The farmers could become involved to whatever extent that they desired, whether it be by providing land, machinery or labour. In Lincoln Shire I visited a large marketing co-operative handling bulbs of daffodils, tulips, narcissus and roses. There were 75 growers supplying bulbs, with areas ranging from 2 - 40 hectares. Advice by the Co-operative is given on type and varieties to grow. The speciality of the organisation was quality control, with particular emphasis on packaging which included full cultural instructions and photos of flowers.

The other basic form of Co-operation which has fulfilled an important role is farm machinery syndication. I visited the farmer who is credited with the commencement of this concept. He has, over many years, run successful syndicates on machinery with his neighbours to the mutual benefit of all.

This type of co-operation is used when a farmer cannot justify the expense of a big piece of machinery on his own farm, or when he doesn't have the labour to perform a farm operation. He then co-operates with neighbours and together they acquire the machine and provide the labour force to perform the farm chore.

There are two basic rules for this syndication to be successful. Firstly you must "get on with" your partner, and secondly, an agreement prior to commencing the syndicate, on the arrangements for the use of the machine, or whose crop is to be harvested first.

For this type of syndication the N.F.U. can arrange finance through a banking organisation for an interest rate 1% above the base lending rate. To obtain this finance the farmers must be financial members of N.F.U. and the parties syndicating must hold a meeting, keeping minutes of the procedure for payment, repairs, and order of use of machinery.

FARM CO-OPERATION AND SYNDICATION (cont.)

On one occasion I saw a slasher owned by a syndicate of three. The order of use was one day each in alphabetical order. It was pointed out that once these arrangements were made, there was no need then to refer to them, as each knew the contract. This system is one that could be used to advantage, especially in the purchase of big and expensive machines that only have a seasonal use. Why are we so independent?

FLOWER AND BULB GROWING

After visiting some horticultural research stations and some farms that are involved in flower and bulb production, one cannot but see that to make money out of agriculture you must grow something that people do not need and cannot eat. This industry is also dependent on a big population, but is one that in years of national poverty brings a good return to farmers.

At Reading I saw a very successful operation, where four crops of Chrysanthemums were grown each year under glass, giving a turnover of £80,000 per hectare annually.

Bulb growing too has been developed as a successful crop, both as cut flower and dry bulb trade. With reference to narcissus, much research has been done on mechanical handling of the crop, and this handling has successfully been accomplished with basic potato handling gear. Bulbs are planted at up to 20,000kg. per hectare. Disease and pest control has become a routine procedure by lifting bulbs each two years. Weed control is by sprays. Research on forcing of bulbs for early flower production has produced satisfactory results. In Lincolnshire, a great many growers have co-operated in a marketing operation trading under the name of Lingarden. There are now over 80 members who grow 800 hectares of bulbs which is about 20% of total United Kingdom production. This co-operative provides the grower with expert packaging and marketing of his crop, leaving him free to use his expertise to produce a quality product. Lingarden markets its products both in the United Kingdom and right across Europe. Loads of packaged bulbs leave Lincolnshire in the afternoon and can be delivered anywhere in Europe the next day, after an overnight trip across the Channel. Managed by an enthusiastic and capable Dutchman the Co-operative is a fine example of what can be effected by co-operation.

FARMERS CLUBS AND COMPETITIONS

I noticed the interest taken in the farmers clubs and the competitions run by these clubs. It is with real pride and a sense of achievement that a farmer would show you the shield or certificate he had won. Some clubs seemed to be a bit exclusive, but catering for different classes of farmers in providing opportunity for discussion, whether it be at discussion groups on farms, or a normal dinner gathering with guest speaker, or on a group travel to look and study some other farm and the farmers operation.

There are competitions conducted on a district basis for total farm management and on dairy farm management. The practice is for the winner the previous year to judge the farms and to prepare a short list, then a farmer or judge from out of the district comes to make the final decision. This gives an added incentive. Farm walks on the winning farm are also held.

CONCLUSION

After the opportunity I have had to look at British agriculture, to talk to her farmers and to live in the country for six months, I must make some observations, draw some conclusions and say, "OK, Where do we go now? What did I learn and of what can we make use?"

At the outset, I cannot but comment that the hospitality extended to me was far beyond expectation, it showed to me that indeed this was the homeland of our Australian heritage.

First observation is that British agriculture has its market at the farm gate, and having this great population to feed makes an enormous difference to rural outlook. Australia, of course, has but a small domestic market. The answer to Australia's agriculture problems is "to have a 10 million population growth, so we can have a home market for our products!" The high population in the United Kingdom puts increased pressures on farming and total land use - pressure for recreational use, for urban development and highways. We find 50,000 acres of good agricultural land disappearing every year under concrete and being polluted by bricks and mortar.

Yes, the agricultural industry is highly scientific, progressive and mechanised, but by Australian standards, farm labour is comparatively cheap. I do believe it would be possible for the United Kingdom to be self-sufficient in all temperate food requirements if this was forced upon the nation, as it has the technological ability, but I fear it would not be economical to be so when there is temperate food available for import at lower costs.

Australian farmers must see soon (or do we have to be driven into the ground more before we realize) that our only hope for agricultural stability is in a single united farmers organisation, which has the financial and physical resources to support and work for our long term benefits. Wake up Australia! Lets get together for our own good and agricultural salvation.

CONCLUSIONS (cont.)

Good management, too, is a lesson Australian farmers must learn. We must endeavour to arrange our work load so as to allow time for effective farm management and effective use of farm resources. Another aspect of farm management I think we should try to adopt, is to take every opportunity possible to get off our own farms and onto someone else's to see what goes on, and to give us opportunities to learn from the experience of others, and to discuss farming techniques.

I realize, and it is quite obvious, that the total United Kingdom farming system would not work in Australia, but I was impressed with livestock feeding and management, and the information that is available to farmers. Silage fulfilled a very important role - here we can learn - our silage making can be improved by using United Kingdom techniques. Maize growing, perhaps the latest wonder crop in the United Kingdom, with varieties that grow under cooler conditions, has made a great impact. It is used for both green crop-feeding and for ensiling and is a very valuable feed commodity.

In conclusion of my report, I must extend my very real appreciation and thanks to all those who made it possible for me to accept and take up my Nuffield Scholarship. My first thanks must go to the Nuffield Scholars Association of Australia, who had the confidence, faith, foresight to continue the scholarship for Australian farmers and in particular, to those who took the initiative to raise the finance necessary for the continuation of the scholarship. I would thank also the United Kingdom Nuffield Scholars Association, through Captain Stewart, John Cyster, and their colleagues of the Nuffield Foundation at the Lodge, A.D.A.S. and N.F.U. members. Also heartfelt thanks to those who extended abundant generosity and warm hospitality to me, during my stay in the United Kingdom, including the 25 families who hosted me on different occasions, to the farmers who gave of their time to talk to me, and to show me around their farms and enterprises.

To the Milk Marketing Board I owe a debt of gratitude and thanks for the generous loan of a motor vehicle for the full six months of my visit.

CONCLUSIONS (cont.)

To be able to take six months off and leave your farm, there is a price to pay, and this is generally paid by someone else. In my case, this fell upon my family and friends. Thanks to my wife for taking over the milking of the cows till the end of the season, and to our relatives who cared for our children for the three months in which my wife joined me in the United Kingdom. Many thanks also to those who kept an eye on things and started the new seasons milking till I returned home.

There is one other of whom I must make mention, and to whom I will be forever grateful, and that is my "first farmer host" Mr. Chris Tozer and his wife Louise. When I was first selected, Chris wrote and extended an invitation to me to stay with him for a fortnight in the beginning, and to make his home my base while in the United Kingdom. Not only did the Tozer home become a base, but it was indeed a "home away from home", a place of rest beside the lovely Test River in Hampshire, where I always returned to unwind, to write, and to catch up on correspondence. They always were pleased to see me, and when my wife arrived, she too was warmly welcomed. We were very grateful for this opportunity to enter into local village life, to meet people, to attend fairs, steam engine rallies, visit local industries on open days and even in getting a lesson on bell ringing at the local church. These days at Tufton will be ones we will always remember and cherish. Thank Chris and Louise!

APPENDIX

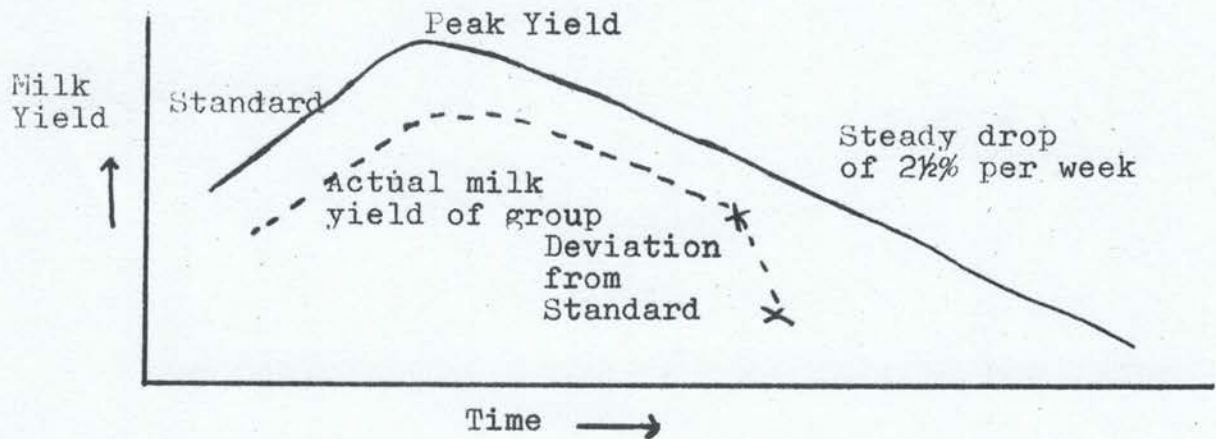
Brinkmanship

A management technique to monitor the production of a dairy herd to gain maximum production and economic use of feed resources, involves the weekly recording of production in monthly calving groups, and then plotting that production, in graph form, against a standard lactation curve. It is vital to monitor the yield of the dairy cow to ensure that the level of nutrition is in harmony with the stage of lactation. Research by Dr. Broster at N.I.R.D., has established that the average drop in yield per week after peak has been attained, is about 2½%. If there is a deviation from a parallel path to the standard lactation curve, then there is likely to be something wrong with the management. The cow will not wilfully withhold milk. If the incidence of mis-management can be picked up by recording within the week, then it is usually possible to rectify the fault. By this regular production recording it is possible to ascertain if the cow is receiving enough feed to maintain economic production.

During lactation, there are two important features concerning milk production which must be taken into account. These are, the decline in milk yield during lactation and the variation in the quality of the food. Weekly recording enables these variations to be assessed and the most appropriate ration to be fed to dairy cows.

The major problem of the dairy farmer is meeting the need of the dairy cow for a high level of energy during early lactation, to enable the cow to attain a high peak yield. The cow must sustain body weight without any excessive weight loss during early lactation. It is also important to reduce the energy intake of the cow in late lactation to correspond with the lowered energy requirement.

How is this balance of feed intake to be assessed and managed? By weekly production recording and plotting against the standard lactation curve. Economic feed management must be parallel to standard lactation curve. Deviation below a parallel line indicates a feed shortage, and above that line an over feed situation, where food offered can be reduced for more effective utilisation.

Standard Lactation Curve

If due care and attention can be given to the monitoring of the dairy herd with reference to milk and feed, the result is very likely to be an improvement in the financial returns from the herd.

Such a system must be used in conjunction with good husbandry practices, particularly regular milking.

The Meadow Orchard System

Due to the increasing cost of agricultural land, and the decreasing availability of skilled hand labour with its high cost, orchardists have sought an answer in the "meadow Orchard" system, whereby it will be possible to handle the entire crop mechanically. The irregular branch system of the apple tree makes it a difficult proposition to mechanically prune and harvest a crop in the orthodox orchard. Another advantage is that this system brings the orchard to its full potential after two years, compared with the 8 - 10 years delay in a modern conventional orchard.

How is it done? Trees planted 12 x 18 inches apart (29,000 per acre) are trained as single upright shoots which, by hormone treatment, are induced to initiate flower primordia in their axillary buds during the first year of growth. In the second year the trees flower and fruit and, at harvest time, are cut back to stumps from which new shoots regenerate in the following Spring. Thus, the biennial cycle of growth and cropping can be repeated many times, although the trees themselves remain the same size and shape. It is envisaged that the fruit

APPENDIX (cont.)

The Meadow Orchard System (cont.)

could be picked by some form of combine harvester incorporating a giant combing device to remove the fruit, a cutter bar mechanism to prune the trees, and perhaps a shredder to macerate the remains and regurgitate them as a surface mulch. Ultimately it might prove possible to plant the trees as a complete ground cover, thereby making maximum use of incident radiation. In such a system all crop protection agents, nutrients, herbicides and hormones would be applied through an automated system of fixed overhead spray nozzles.

Growth Regulator Treatments The growth retardant S.A.D.H. (=succinic acid 2,-di-methylhydrazide = "Alar") is used to arrest growth and induce flower initiation in the first year. In the second year, the same material applied shortly after bloom has the effect of diverting assimilates from the shoots to the young fruits, thereby increasing fruit retention and augmenting the final crop by a factor of 2 or 3.

What then is the limiting factor at the moment for this system? It is the initial capital cost of planting the orchard with 70,000 plants per hectare. If this problem can be overcome, to me, it looks a goer. The answer to the question as to what quantity of fruit this system will produce is that results to date have shown that up to 80 tonnes per hectare have been grown. Remembering that this is each two years, it then averages at 40 tonnes, which is the average United Kingdom crop.

Maize for Silage and Grain

Soil Extreme types of cold wet clays and very light sands should be avoided. A wide range of soils is, therefore, suitable as long as the pH is 6.0 or above.

Fertilizer 100 - 120 units N, 50 - 80 P and K. Further work is being done to determine crop needs under United Kingdom conditions. The crop benefits significantly from moderately heavy applications of F.Y.M.

APPENDIX (cont.)

Miaze for Silage and Grain (cont.)

Drilling Precision drill at depth $1\frac{1}{2}$ - 2 inches using dressed seed (Thiram).

Sowing Date End November - Mid December when soil temperature at 4 inches reaches 10°C (50°F).

Weed Control Atrazine (Gesaprim or Vectal) at recommended rates. 2 - 3 pounds per acre.

Pest Control Frit Fly Phorate granules at drilling time - avoiding contact with seed. Birlaine granules post emergence at 10 pounds per acre. Rogor granules post emergence or Rogor Spray at 24 fluid ounces per acre in 20 - 40 gallons. Bird Damage Nylon thread on 4 - 5 inch canes 30 - 40 inches apart.

Plant Populations Crops generally grown on 30 inch row width to match harvesting machinery, although there is some latitude - for grain 28 - 32 inches, silage 12 - 40 inches.

<u>Silage</u>		<u>Grain</u>
row width	30"	30"
plant spacing	$3\frac{1}{2}$ - 4"	$5\frac{1}{2}$ - 6"
optimum population	45,000	36,000
10% losses	50,000	40,000
sowing rate	30/40 lb/acre	25/35 lb/acre

The weight sown varies according to grain size between varieties and within a variety between seasons. Seeds range from 1,200 to 2,000 per pound.

Harvesting Silage The crop should be finely chopped (about $\frac{1}{2}$ ") to ensure good end product, cutting when the grain is at least cheesy ripe. Dry matters of whole plant should be at least 20% for pit silos and 25% for towers.

Grain The crop can be combined when grain moisture falls below 40%. Drying is generally a two stage operation. Wet storage using proprionic acid, $4\frac{1}{2}$ gallons per ton is an alternative.

APPENDIX (cont.)

Growing Grass for Silage

Use of Seperate Cutting Block I.C.I. work has found that best results are achieved on farms where the conservation area is sepearate from the grazing area, as in the Two-Sward System. This means that the choice of grass seed varieties when the ley is sown down, and its subsequent management, can be concentrated on obtaining an ideal crop for cutting. Further incidental but practical benefits of this are that fields in an arable rotation which are less suited to grazing for reasons of fencing, water or access, can be cut two or three times in the year and quickly returned to cash cropping.

Grass Varieties for Silage Results will normally be better if only one grass variety is used in each sward so that all the grass in the field is ready for cutting at the same time. However, one or two fields of an earlier or later maturing variety can help to speed the harvest period. Varieties range from the short lived but bulky Westerwolths type of Italian ryegrass, very suitable for catch cropping, to later maturing and more persistent forms of perennial ryegrass found in permanent pastures.

Fertilising Grass for Silage Yield differences due to variety are small in relation to the effect on yield of fertiliser, particularly nitrogen. The efficiency of the silage harvesting process is such that 50% higher nitrogen rates can be used on grass for silage as opposed to hay, producing up to 20% higher yields of conserved food. The recommended fertilizer treatment will normally produce enough silage from one acre cut twice to feed two dairy cows or three fattening bullocks through the winter.

Time of Cutting

As grass grows the yield of dry matter increases, fibre increases but digestibility and protein fall. The aim should be to cut the grass at an optimum yield and digestibility of 63D value (63% digestible organic matter in the dry matter)

APPENDIX (cont.)

What is Good Silage

Good silage is palatable, digestible and nutritious. When fed to a Friesian dairy cow ad lib with 4 pound of barley per day it should be capable of producing maintenance and 2 gallons of milk. When similarly fed, a good fattening bullock on an 18 month beef system will put on 2 pounds per day when fed 6 pounds of barley, whereas a suckler cow will not need any cereal supplement when also fed silage to appetite.

Palatability Soiling of herbage with earth, stones, dung, etc. reduces palatability and is a prime cause of the wasteful type of fermentation which can lead to excessive acidity and reduce intake. Careful field preparation and correct setting of the harvesting machinery will reduce this. The undesirable development of a putrid (butyric) primary fermentation and of secondary fermentation after the silo has been opened will also make silage less appetising to the animal.

Digestibility and nutritive value The importance of cutting grass at the right stage of growth in order to get high quality silage is discussed in more detail later on. Cutting at the correct stage must be the paramount consideration.

The ensiling process does involve a loss in feed value but silage additives which bring about acid conditions more quickly can reduce these losses. "Sylade" has the added advantage that it reduces fermentation and so prevents the development of excessive acidity in the silage which can reduce intake by the animal. The formalin in "sylade" alters the protein in a way that protects it from wasteful digestion in the rumen and preserves it for more efficient utilisation in the small intestine. In this way more of the valuable grass protein, which can be enhanced by adequate nitrogen fertiliser, is utilised by the animal.

Secondary fermentation which results in further loss of feeding value when the silo is opened is often reduced in "sylade" treated silage.

AN ENDIX (cont.)

The Importance of Fermentation

An edible product can be preserved by various methods such as drying, dehydration, freezing, radiation, de-oxygenating, or chemical preservation. Each of these methods can prevent decomposition of the food by undesirable bacteria and moulds.

Traditional silage methods rely on the production of acid conditions to check putrefactive fermentation. The acidity is produced by lactic acid bacteria which thrive in the absence of air and require readily available sugars. The use of "sylade" produces the necessary acidity quickly and preserves the forage without excess loss of sugars.

The need of wilting Wilting is essential where the material is to be stored in towers (35 - 40% DM). With all other methods wilting is desirable as it improves animal intake, aids fermentation, reduces seepage and lessens the weight of crop to be transported and stored. It should be undertaken provided that a dry matter level of at least 22% can be achieved but it should never be extended beyond 24 hours or field losses will outweigh gains.

The Kind of Forage Harvester Forage harvesters are normally classified by the degree to which they chop the grass. The significance of chopping is that it produces a denser material which consolidates better and makes more economical use of trailers and silos (particularly towers). It leads to better fermentation because the finely chopped material spreads evenly and excludes air. Chopping is also essential for any mechanical handling system of feeding silage.

A double chop or a precision chop forage harvester cuts the material into shorter lengths. This speeds up the access to sugars and, what is more important, the chopped material is denser and air is excluded more effectively.

APPENDIX (cont.)

Sheeting the Silo

Whatever the method of preservation the sides and back of the clamp should be lined with polythene sheeting before filling gets under way (sleeper walled clamps should be first lined with old fertiliser bags). Each night the face of the silo should be covered with sheeting as in Dorset Wedge system. In this way the minimum surface area is exposed to the air.

Polythene sheeting also prevents surface waste by restricting exposure to air and water. There is little need for a polythene covered clamp to be roofed unless straw bales are to be stored on top.

Feeding System

In any system of feeding silage there is a risk of loss of nutrients through secondary fermentation but this is controlled in silage made with "sylade". The choice of feeding system will depend on factors such as:

- (a) The proportion of the ration which is silage
- (b) Layout of clamp in relation to cattle area
- (c) Availability of labour for silage handling

Some Possible Systems:

Self Feeding The cattle have direct access to the clamp and are controlled by a barrier (even an electric fence). Silage is eaten to appetite although intake can be limited if the ensilage grass is long and highly compacted. Self feeding can be wasteful if the face is not eaten back uniformly and secondary fermentation can result if the exposed silo face is too large. The labour required for feeding is minimal but scraping slurry away from the silo face can be a chore.

Easy Feeding A trough extends along the silage face and silage is thrown down into it. A smaller face is exposed and this reduces waste but requires more labour. It is a useful system for young cattle that may be shedding their teeth. With easy feeding silage intake tends to be higher than with self feeding.

APPENDIX (cont.)

Feeding System (cont.)

Cutting and Carting Cattle do not have direct access to the silo. Instead the silage is mechanically extracted from the clamp face (or tower) and dispensed using a forage box, fore-end loader or conveyor belt into troughs near where the cattle are housed. The main advantage is that the silage can be rationed. Removal from the silo face is usually by fore-end loader, grab or by a sophisticated auger system, and therefore it is important that the grass at harvesting is finely chopped. Tower silos with self unloaders have a smaller labour requirement for feeding.

AUSTRALIAN NUFFIELD FARMING SCHOLARS ASSOCIATION

PLEASE COMPLETE AND RETURN NO LATER THAN MONDAY, 8 APRIL, 1996

Surname: CARINS

Initials: M.T.

Name by which you are usually known: MALCOLM

Degrees, prof. affiliation, honours, etc: Ass. Dipl. Business in Agriculture

Name of spouse: ALISON

Address: (if possible not more than four lines including postcode)

WARRENTINA Rd.

WINNALEAH.

Post code 2265

Telephone/Facsimile numbers you are happy to publish in the Directory:

Business: ()

Home: (003) 542121

Car: ()

Mobile: ()

Fax: ()

Subject of your study: DAIRY FARMING

Countries visited: UK

Current business or employment: (not more than 30 words)

RETIRED

Off farm involvement in the industry and community: (not more than 30 words)

Bill Casimaty 1967

Following his scholarship he founded Strathayr Instant Lawn and has developed the cool season turf industry in Australia. He now markets turf throughout the nation and recently won a contract in Hong Kong.

He has played a major role in the development of irrigation in Tasmania and is a member of the Council of the University of Tasmania, and Chairman of the University Farm Committee. He is also a past-President of the Tasmanian Oil Poppy Growers' Association which pioneered access to the U.S. market.

Tasmanian Rural Promotions Committee
1987 Award for an Outstanding Contribution to Tasmanian Agriculture.

Daryl Barker 1969

As a result of his tour he concentrated on producing beef cattle, prime lambs and potatoes.

His practical expertise was recognised and he is now a Rural Advisor to Commercial Banking Interests. He is also one of few Stock Assessors for C.A.L.M. (Computer Aided Livestock Marketing) in this state.

He has won beef cattle carcass competitions both in Tasmania and interstate and has also judged beef cattle both here and interstate. He is also an active stock agent, giving regular marketing reports, etc.

Don Walker 1972

Primarily a sheep, cattle and cashmere goat producer, he is Federal President of the Australian Corriedale Association and was President, Royal Launceston Show (1986/87) Chairman, Hagley Farm School Board (25 years), a member of the Rural Training Advisory Committee and Tasmanian Livestock Exporters Council. He is Chairman of the Organizing Committee for the World

Corriedale Conference to be held in Melbourne in 1990, and was on the organizing Committee for the World Ploughing Championship in 1987.

Ian Farquar 1972

One of the State's pioneers of essential oil production and now as a leading producer, Ian is heavily involved through Essential Oils of Tasmania Pty. Ltd., in a joint venture with the University of Tasmania and the Tasmanian Development Authority, in marketing and research for 65 grower members.

He is a member of the Agricultural Science Faculty of the University of Tasmania and the T.F.G.A. Small Seeds and Education Committees. His farm crops include vegetables for processing and for seeds, as well as parsley, mint and fennel for oil.

Malcolm Carins 1975

Visited the U.K. and Europe to study dairying. Has, as a result of his tour, diversified into floriculture - specifically commercial Daisy production and mint oil, as well as high grade beef production. He is also very active in a number of local sporting clubs, and the Liberal Party Rural Policy Committee. He was the Convenor and Inaugural President of the Tasmanian Floricultural Association.

For 9 years was a board member of T.H.I.O. (Tasmanian Herd Improvement Organization).

Michael Bennett 1978

Manages a diversified farming operation which includes dairying, beef, sheep, peas, poppies and farm forestry. Michael says the Nuffield experience profoundly improved his management skills and widened his outlook.

He was a representative of the Vegetable Council, to the General

Council of T.F.G.A. and a committee member of the Poppy Growers Association.

He is past President of the local Rotary Club, as well as being a member.

John Bignell 1982

John's Nuffield study project was venison production and marketing. He is now one of the recognized authorities in Tasmania on the subject, but during his Scholarship he also came to grips with a range of farm management techniques and issues, including animal welfare.

He is a member and past Chairman of the Hydatid Eradication Council and President of the Deer Farmers Council and is hoping to establish a deer research unit at the University of Tasmania.

Founder and Inaugural Chairman of the Deer Farmers Association. Instrumental in achieving this Association as a T.F.G.A. Council and duly part of the Federal Deer Farmers Association.

Prime initiator of marketing venison in Tasmania and co-initiator of deer handling equipment, enabling deer to be handled as farm animals.

Tony Robertson 1983

One of Tasmania's foremost vegetable growers. He is President of the Onion Committee of the Vegetable Council of the T.F.G.A. Recently he has been retained by the Fijian Government to provide technical advice on potato growing.

Andrew Jones 1985

Pioneered vegetable seed growing in South Eastern Tasmania and now supplies both local and overseas markets. He is continuing to develop this new industry in that region.

Crops include Hybrid Brassicas for seed production, Pyrethrum and a wide range of other new crops.

Further information is available from:

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