THE UK GOAT INDUSTRY - 40 YEARS AND GOING FORWARD

Kathleen Wielkopolska, BSc.Hons (Agric), Director of Yorkshire Dairy Goats, The Farm Office St Helen's Farm, Seaton Ross, York, East Yorkshire, YO42 4NP.
kw@yorkshiredairygoats.co.uk

Thirsk October 2019.

In the post-2nd World War era of the 1950's & 60's, the driving force in primary food production was food shortages. Those shortages, combined with relatively low yields from grassland, crops and livestock, led to the widespread use of artificial fertilisers, pesticides and antibiotics in agriculture. During the 1970's and 80's outputs increased as new crops, new crop varieties and new technologies emerged while livestock performance improved; all this combined with widespread destruction of hedgerows to increase areas of land for pasture and cropping.

The resulting over production of the late 80 's & 90's led to butter mountains and wine lakes etc. and the introduction of milk quotas across the EEC in 1984. Legal quotas to produce goats' milk have never existed. Farm Assurance Schemes were put in place and have led to more and more formal planning, recording and reviewing. A Goat scheme was introduced in the 90's in the UK and is now recognised by Red Tractor. This requires a Herd Health Plan to be in place and jointly reviewed with the farm Veterinary Practitioner. 2020 sees a requirement to provide and review the total annual usage of veterinary medicines on each farm as part of the Plan.

Environmental factors began to be highlighted and acknowledged with the introduction of strict control of the output, storage and use of organic manures to avoid contaminating ground water and ultimately drinking water supplies with nitrates, nitrites and, more recently, phosphates. Now the re-establishment of hedgerows and wildlife friendly farming methods are actively encouraged. Sadly, the general public is largely divorced from the reality and understanding of farming and the NIMBY (Not In My Back Yard) approach is all too common.

40 years ago, most goats had been kept on farms and smallholdings in 1's and 2's whilst there were small dairy goat herds for breeding and showing. Some herds of 20-100 goats were, and still are, kept for milk to make specialist cheeses. In the late 80's supermarkets were well established and a small market for goats' milk and goats' milk products were developing. It is against this background that goat farming became more commonplace in the UK, with imported Angora goats for fibre, imported Boer goats for meat and dairy goats for milk. A small number of Angora and Boer goat herds persist to this day, with some dairy farmers using Boer bucks to produce meatier dairy cross from a proportion of their herd.

In the early years there was a general lack of knowledge and experience of commercial goat farming amongst farmers and veterinary practitioners, as well as in goat milk processing and ancillary industries. Farmers began to diversify or specialise in alternative farming and non-farming enterprises, as various government schemes enticed them away from traditional farming. Some tried goats and succeeded, whilst others failed, often because they had switched from one failing enterprise to goats or because they were financially under-

resourced. The few that persisted and have grown and improved, learning through trial and error, how much skill and expertise is required on all fronts to farm goats successfully, firstly, by acknowledging that a goat is not a small cow; secondly, that a goat is fundamentally psychologically different form all other farm livestock; thirdly by being pro-active rather than reactive; and fourthly by applying sound scientific principles to all aspects of goat farming.

Milking parlours for goats originally had no automatic cluster removal and parlour designs were basic and often similar to the herringbone cow parlours. As suppliers became more familiar with the specialities that were required for goat milking, more sophisticated herringbone style, rapid exit and rotary parlours became available. Milk recording ranges from none at all, to manual monthly sampling or full-scale automated recording for milk yield, and milk conductivity for every goat direct to a computerised data system that rely on electronic ear tags in goats. Feed suppliers can now supply goat rations and kid milk replacer specifically formulated for goats.

Roadside sales of raw goats' milk of dubious quality persisted into the 90's with no specific regulation or statutory testing on goats' milk. Against a realisation of rising consumer interest in, and there being no statutory tests & no specific regulation on goats' milk, the Public Health Laboratory Service (PHLS) conducted a goats' milk survey in 1982/83. The Scotland Department of Agriculture & Fisheries recognised the need and published a Code of Practice on the Hygienic Control of Goats' Milk in 1984.

The various food scares in the UK: BSE ('Mad Cow Disease') in cattle in 1986; Salmonella in eggs ('Egwina Curry') in 1988; Listeria monocytogenes contamination of mould ripened cheeses ('Listeria Hysteria') further heightened the awareness of government and authorities, the food industry and the general public and ironically 'helped' to establish the market for pasteurised goats' milk in the UK. Commercial goat keeping was in its infancy.

In the aftermath of the BSE crisis, there was a growing lack of consumer confidence in the UK Ministry of Agriculture, Fisheries and Food (MAFF), whose responsibility was for food production and food safety – a mandate that was increasingly perceived to be a conflict of interest. It's handling of the 2001 Foot and Mouth Disease outbreak was severely criticised and MAFF was dissolved in 2002. The Food Standards Agency (FSA), created in 2001, was tasked with responsibility for administering monitoring and enforcement of food regulation from 'Farm to Fork'. It pledged to make decisions about food policy in open Board meetings accessible to the public, which is still the case. Various other government agencies related to the agricultural and veterinary world have merged and changed their names. The net effect is fewer, more centralised agencies and services. Amongst farmers and veterinarians, concerns have been raised over the low number of veterinary diagnostic laboratories (formerly Veterinary Laboratory Agency {VLA} laboratories) that have been retained by the Animal and Plant Health Agency (APHA) although some University Veterinary Departments are now offering similar services.

40 years ago, people bought milk from the milkman who delivered the milk pasteurised, but unrefrigerated, every morning and it was typically consumed on the same day. The driving force in pasteurisation was food safety i.e. freedom from diseases communicable to man principally Tuberculosis and Brucellosis, although the final pasteurisation temperatures of 63^{o}C for 35 minutes, or the equivalent 72^{o}C for 12 seconds, was based on the destruction of Coxiella burnettii, that is responsible for Q fever in animals and man. In 1998, Mycobacterium avis subsp. paratuberculosis (MAP) was shown to be able to survive

traditional pasteurisation parameters and this resulted in increased milk holding times from 15 to 25 seconds.

In the 1960's the introduction of cows' milk to supermarkets and the undercutting of doorstep milk prices, resulted in the road to the demise of the milkman. By the 1980's milk shelf life had increased to 5-8 days. Improvements in milk hygiene from farm through processing to final product combined with more consistent temperature control and a reliable cold chain led to the increase of shelf life to 10-12 days in the 1990's and with traditional pasteurisation methods may now typically have 16 days shelf life. The current limiting factor on milk shelf life is milk spoilage organisms and organoleptic properties. Milkmen have become a rare breed, selling more and more non-dairy items to maintain their income. Although there are subtle differences in processing of goats' and cows' milk, the microbiological principles relating to shelf life are the same.

The demand for goat dairy products increased year on year form the late 80's until 2008, when the recession hit, and has remained relatively stable in the home market ever since. The introduction of more plant based 'milks' has impacted the goat dairy sector negatively. Worldwide there is currently good demand for high quality breeding stock and a strong demand for imported goat milk formula, especially from China and other Asian countries. Following the melamine scandal in China, that resulted in contaminated cows' milk infant formula causing infant mortalities, the desire for product manufactured in first world countries by first world companies has persisted regardless of the milk type.

In 1973 the UK joined the Common Market and until then the UK parliament had established Acts & Regulation (Statutory Instruments) to serve its own needs. Within the European Community, EU Directives were issued that required Member States to interpret and create Regulations from e.g. the EU Directive 92/46 on which The Dairy Products (Hygiene) Regulations 1995 were based. The introduction of this piece of legislation was a landmark for the dairy goat world since it was the first time that it non-bovine milks were defined in UK law. With the increase in number of Member States there has been an increasing trend towards EU Regulation, in place of Directives, thus avoid differing interpretations and facilitating a more consistent approach across the EU. In some cases, this has, however, led to additional UK Regulation, where the EU Regulation has not been considered adequate.

In response to a series of food crises in the 90's, the EU created the European Food Safety Authority (EFSA). Infant Goat Milk Formula brands were banned from sale in Europe by EFSA from 2006 to 2014 following the introduction of very tight EU Health Claims Legislation in 2006.

During the past 40 years the range of laboratory technology both in the Food Industry and the Veterinary sector have seen enormous changes. In milk and food component testing wet chemistry methods have given way to various Infra- Red types of analysis e.g. Near Infra-Red (NIR) and Fourier Transform Infra-Red (FTIR) methods that can be used as stand alone instrumentation in production facility inhouse laboratories, on process lines and in dedicated milk laboratories on fully automated lines generating results that can be communicated instantly back to the farmer by text or e-mail.

Traditional microbiological methods for plating milk samples on agar for 3 days to obtain Total Viable Counts of mesophilic bacteria in bulk raw milk have been replaced by Bactoscan or other indirect rapid methods, generating results in 24 hrs or less, allowing investigations and decisions on farm to be implemented without having to wait 3 days for

plates to be cultured and read. The vast majority of such testing is now carried out in 3 milk laboratories in England and Wales compared to the many scattered MMB regional laboratories that existed in the past.

A variety of rapid tests exist for presumptive detection of Enterobacteriaceae and Staphylococci in bulk raw milk while some farms culture individual goat milk samples on pre-prepared agar bi- or tri-plates to check for mastitic organisms. Various other indirect forms of mastitis screening exist in the form of milk conductivity meters either used manually or in-line on the milking parlour. Overall the incidence of mastitis in goat herds remains at a low level in single figures and the use of dry period therapy is rarely used.

Simple and rapid ELISA and similar tests are now available to detect presence/absence of cows' milk contamination of goats' milk; raw milk in pasteurised milk or beta-lactams in raw milk in a matter of minutes without sophisticated equipment.

During the outbreak of Foot and Mouth Disease in 2001, the goat sector remained largely unaffected, even though many goat farms were in, or close to, infected areas. The first case of caseous lymphadenitis (CLA) in was diagnosed by SRUC Veterinary Services in 1996 in the UK in sheep. Although it occurred more frequently in sheep, a few cases began to appear in a few goat herds in the late 90's. In one notable case, a CLA infected herd was sold by dispersal sale in 2002, regrettably leading to clean herds becoming infected in England. In Northern Ireland CLA remains a notifiable disease. Unlike FMD that is a relatively easy virus to kill, experts from the Netherlands advised at the time that the causal organism of CLA may be almost impossible to eradicate from a housed herd of goats.

Sporadic isolated outbreaks of Q Fever, a zoonosis caused by Coxiella burnetii, have occurred in goat herds in the UK and with appropriate responses have enabled the disease to be managed, if not eliminated. This is in stark contrast to the situation in The Netherlands where the largest recorded outbreak occurred from 2007-2010 with over 4,000 human cases diagnosed, with some fatalities, leading to the slaughter of thousands of milking goats. The circumstances were ideal for the uncontrolled spread of disease: a very small country with dense human populations in close proximity to an area where there were many densely populated goat farms and goat manure being transported through towns and villages for disposal, often to neighbouring countries. The result has been to curb the expansion of the dairy goat industry together with other costly control measures, and a general distaste among the population for the industry.

Listeria monocytogenes has been a constant aggravation over the years. Goats are more susceptible than cattle or sheep to clinical disease, most commonly presenting as encephalitis, except where the exposure is extreme, and cases of abortion or weak kids can occur. A long incubation period of up to 56 days does not help to pinpoint the source. Soil contamination from the environment or from poorly ensiled feed is the usual cause, although anecdotally it would appear that a low level of contamination may confer some resistance. Whilst Listeria cannot survive effective pasteurisation, its presence in dairy products has mostly been in soft or mould ripened cheese. Here, or in ensiled feed, Listeria appears to grow in localised spots in association with mould, aided by presence of air and insufficiently low pH, that provide favourable conditions for multiplication. Listeria can be notoriously difficult to isolate.

In the 70's and 80's there was a strong bias towards breeding selection decisions based on pedigree records and minimal animal performance criteria. From then until now, natural

service has prevailed with very little use of AI, except to introduce superior genetics within closed herds. Some herds have carried progeny testing and made significant strides forward in terms of milk output and overall performance. In collaboration with Scottish Rural University Colleges (SRUC) one herd in the UK has seen the widespread use of genomics to select bucks for breeding replacements. Instead of waiting for 3-4 years to generate progeny test results, when a buck has passed most of his useful working life, genomics provides validated predictions from DNA samples of neonates, shortcutting the time for generational progress to be made.

In the past most goats in the UK would have been purebred or pedigree animals in small herds. With the advent of commercial dairy goats, highly regarded breeders provided the original source for breeding bucks and in many cases still do. Most commercial milking goats are now crossbred. In recent years, the Yorkshire Dairy Goat breed, a 3-way composite breed of British Saanen, British Alpine and British Toggenburg has been recognised by Defra.

So, what does the future hold for goat farming in the UK? Although Tuberculosis (TB) in goats is relatively rare, it remains a significant threat in High Risk TB areas of the country. Much like the 'pig cycle' it appears that the 'goat cycle' is here to stay; with new goat herds starting up when the economics are favourable and herds closing down when they are not. The GVS has served the goat industry well and goat veterinarians are now well equipped with knowledge and understanding of commercial goat keeping compared to 40 years ago. However, there is no room for complacency within the industry as climate changes, and with it the possibility of new disease patterns, new disease vector status and as antimicrobial resistance travels so readily across species and the globe.

Undoubtedly there will be a stronger emphasis on animal welfare across all farmed species, not just goats. Many farms have recognized that goats are capable of long lactations, and so the trend of kidding a doe every year will reduce as time goes on; removing the end of pregnancy, kidding and early lactation for both goats and livestock personnel. It is possible that in future years a doe will only have 1 or 2 extended lactations in a lifetime. New Zealand has seen the first trial of female sexed semen for goat AI take place in 2019 where 783 does on several farms were inseminated, resulting in a 54% conception rate with 92% doe kids born. This could eventually result in the reduced number of unwanted male kids. Environmental considerations will undoubtedly come to the fore, and we may see less silage bales wrapped in plastic. We can all hope for a more commonsense approach to food labelling amongst other issues, as we anticipate more legislation across the board in the future, not less.