



Raw Milk Producers Association

newsletter

Chair's Report

Welcome to our first newsletter. Each quarter we aim to bring you news that will benefit your raw milk business by sharing risk analysis information, farmer profiles, a series of 'how to' articles, help with regulatory compliance, food safety tips, discounts available to RMPA members and much more to keep you up to date with all things raw milk.

These are exciting times! We have come far over the past 12 months: from the initial meeting with the FSA and the NFU in London to the first idea of creating a producers' group, and the great success we had at our Stoneleigh open meeting where over 60 producers came to listen and discuss the idea. Encouraged by the overwhelmingly positive response, we went on to form a committee, set up a website and a producer email forum to engage and easily share information.

We are now registered as a Co-operative Society with over 70 members representing 1.8 million litres of RDM sales per year, the email forum is an active hub of collaborative peer-to-peer help, and we have had the good fortune of finding Dr Cat Berge and Prof Dr Ton Baars, world leading experts in raw milk to work with us. Inside are details of the raw milk workshops we have planned with Cat and Ton – these are not to be

missed, packed with essential information on the safe production of raw milk. Our first AGM will be on 6th September at Fen Farm Dairy – more details inside.

With all the FSA's changes soon coming into effect, now is a very important time for raw milk producers to come together. As a country we are already world leaders in animal welfare and farming standards. We believe that it can be the same for raw milk production as well.

Jonny Crickmore



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E.coli for Dummies

The first in a series on pathogen risks in raw drinking milk: what are they, where do they come from, how can producers control the risk of contamination in their milk and verify those controls. Escherichia coli for dummies.

Paul Thomas FIFST | www.wheymaker.com

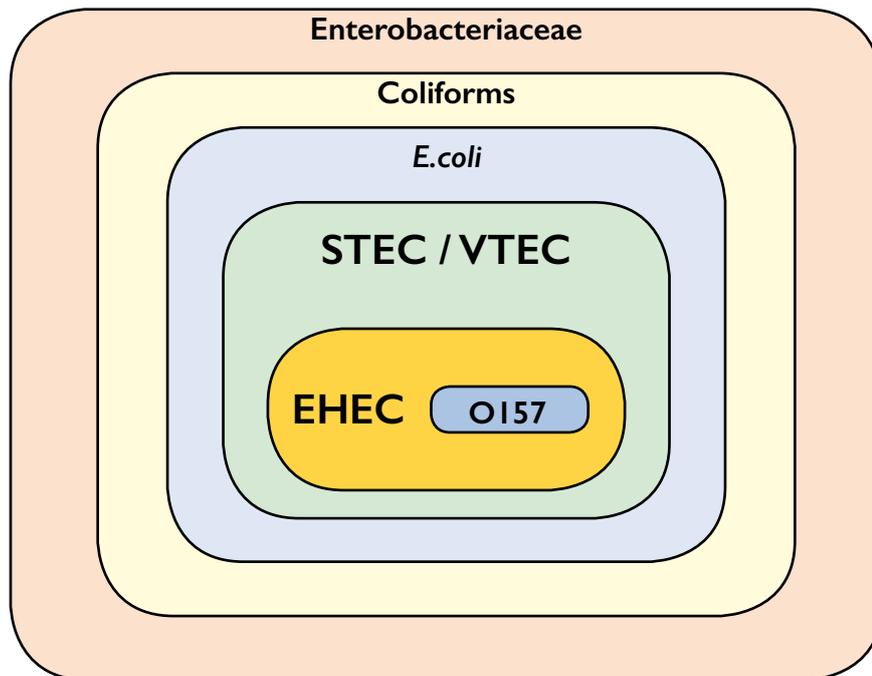


Figure 1: The relationship between STEC, E. coli, coliforms and Enterobacteriaceae

Enterobacteriaceae are a large group of organisms which includes a subset that can ferment lactose (called coliforms) as well as others which cannot, including *Salmonella*. Within the coliforms we find some species, such as *Escherichia coli*, which live in the mammalian gut and contribute towards the correct functioning of the intestines. Because they are found in the gut, these organisms are sometimes used as indicators of faecal contamination in milk or dairy products, which can increase the risk of transmission of some pathogenic bacteria.

What is E. coli?

Although *E. coli* is classified as a single species, it comprises a diverse group of different strains. Most are harmless, with some living symbiotically in the human gut. Some, called Shiga toxin-producing *E. coli* (STEC, or alternatively VTEC), have the potential to cause diarrhoea and serious

illness because they carry genes for a toxin. EHEC are a small subset of the STEC strains that are highly pathogenic and have been associated with disease in humans. They include *E. coli* O157:H7 along with several other 'non-O157' strains such as O26:H11, O103:H2, O145:H28 and O111:H8. These are sometimes described as the "most pathogenic serotypes". While many STEC strains have been identified which are not associated with human disease, the 'promiscuity' of the species and ease with which *E. coli* shares genetic material means that there is a potential for a 'harmless' organism to acquire the genes necessary to cause serious illness, which can be fatal. The presence of a low level of non-toxicogenic *E. coli*, or coliforms, in raw milk is almost inevitable. A laboratory result of <1cfu/ml indicates a very low level of faecal contamination but this is not the same as saying that it is not present at all.

While some studies have shown that indicator organisms, such as *E. coli* or coliforms, are not reliable indicators of pathogen presence in dairy products, they can point to higher levels of faecal contamination of the raw milk. This would increase the risk of transmission of some pathogens associated with the gut, such as *Salmonella* and *E. coli* O157:H7 if they were present. This is an important distinction – elevated levels of hygiene indicators do not mean that a batch is unsafe, but they may point towards milk production practices which increase the risk of contamination by some harmful bacteria.

Testing

It is possible to test for *E. coli* or coliforms in raw milk. The result can identify elevated levels of faecal contamination but will not differentiate between harmful and non-pathogenic strains. Regulation (EC) 2073/2005 does not set an end-product test for O157 or STEC in ready-to-eat foods but recommends that the hazard is controlled by preventing faecal contamination in the food chain, and this can be evaluated by monitoring faecal contamination indicators.

It is also possible to test for *E. coli* O157 using traditional microbiological techniques. This test is widely available but will not detect non-O157 STEC belonging to the most pathogenic serotypes, such as O26:H11.

A newer, molecular biological technique called "Polymerase Chain Reaction" (PCR) is available which is highly sensitive and can detect small quantities of DNA belonging to STEC organisms. It can identify non-O157 organisms but will also identify strains that have not previously been associated with serious human illness and there is some debate over how the results should be interpreted. It has been proposed in the UK that the identification of the stx toxin gene in an *E. coli* which can then be grown on an agar plate ("isolated") would pose an unacceptable risk to consumer health due to the potential for STEC to cause diarrhoea. The test is less widely available than O157 testing and not all labs offering the PCR test are permitted to carry out the isolation of STEC necessary to confirm the presumptive result. Furthermore, some public health laboratories which offer the test have limited the services available to

new private customers.

While some non-O157 STEC organisms are unquestionably associated with more severe cases of disease, issues over the provision of testing could mean that O157 testing, along with regular evaluation of faecal contamination indicators, might be a more practical approach for most businesses.

Test	Cost	Availability	Detects pathogenic O157 STEC	Detects non-O157 STEC (also regarded as pathogenic)
<i>E.coli</i> /Coliforms	£	Widely available	N	N
<i>E.coli</i> O157	££	Widely available	Y	N
STEC by PCR	£££	Limited availability of labs able to confirm a presumptive result by isolating this <i>E.coli</i>	Y	Y

Regulatory Update

The current Food Standards Agency raw drinking milk (RDM) controls consultation will have far reaching impacts for all RDM producers, and for consumers.

One of the key objects of the RMPA is to promote the interests of raw milk producers by working with the regulator to bring about fair, proportionate and effective controls that will allow the sector to flourish and produce safe raw milk for consumers.

The RMPA committee has been consulting with RDM producers via its members' email forum to ensure their views are represented in the meetings with the FSA RDM operations, policy and microbiological teams. The discussions have included looking at data trends for microbiological tests in relation to changes in production and sales volumes, and food-borne illnesses associated with RDM.

The industry has changed dramatically over the past few years. In 2012 sales of RDM were around 600,000 litres from less than 100 producers. By 2018 sales had increased five-fold to well over 3 million litres from over 160 producers. There had been no RDM-related illnesses between 2002 and 2014, but since 2014 to date, there have been a number of outbreaks around the country. It is this increase that has raised concerns within the FSA that the controls around becoming a licensed RDM producer, and the on-going food safety management processes needed to be tightened.

The FSA has been extremely welcoming and our discussions have been open and honest on both sides. There is no agenda by the regulator to ban raw

milk sales, but there is a clear urgency to bring about change in the controls around risk identification and mitigation, as well as documented processes and tests that verify these controls. The FSA wishes the producer to be in control of their production and responsible for its safety without overbearing inspections. To this end, the consultation proposes less frequent visits by the Dairy Hygiene Inspectors (DHIs),

which will reduce costs for both producer and regulator. But in return the farmer will need to display a clear understanding of their own farm's risk profile, demonstrate mitigation processes and show that these are working through their own testing regime, in what is called a Food Safety Management System (FSMS). This is in line with all other food sectors.

With the new FSA controls due to come into force this year, providing guidance and support for producers in terms of production standards, hygiene or microbiological testing, is a second key objective of the RMPA. As part of this, we have arranged workshops on 6 & 7 June, with two of the world's leading raw milk experts, Dr Cat Berge and Prof Dr Ton Baars. Further details on p7.

Are you FSMS ready?

Raw milk producers will be required to have a Food Safety Management System soon. Some, especially those who also process milk into other products, will be familiar with the HACCP (Hazard Analysis Critical Control Points) system that is used to assess the risks involved

in producing food and identify ways to control them, and then verify these processes are working. Although a HACCP plan is not required for primary (agricultural) production, having some kind of documented HACCP-based FSMS will be necessary in future for RDM producers.

It is important to note that microbiological testing is not a food safety measure in itself (we can't test every batch

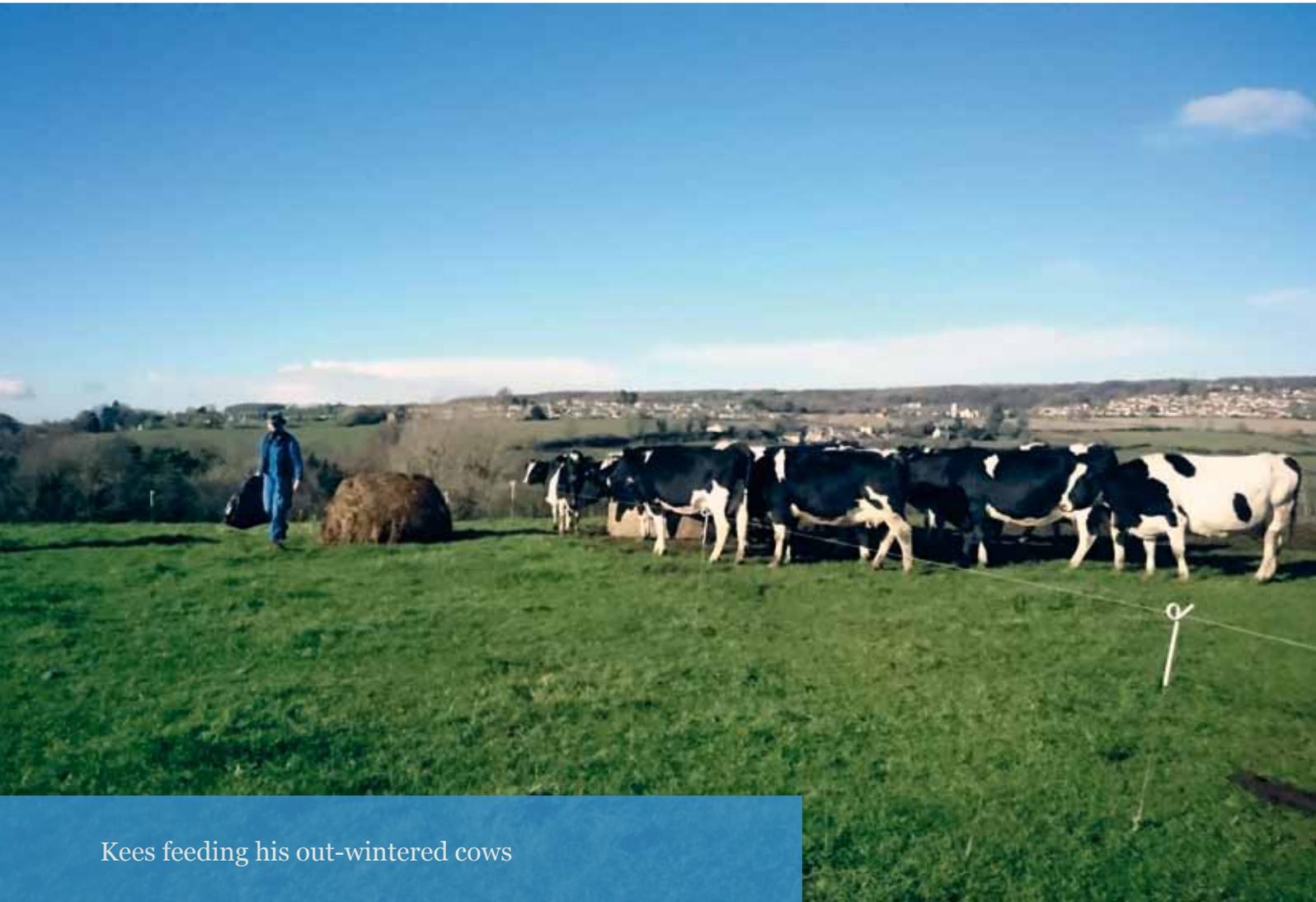
of milk for all pathogens, and imagine if we waited for test results to come back before selling the milk!), but a way of verifying the food safety measures taken are working. The hazards you identify in your FSMS and

measures you take to avoid them are particular to your farm and can inform how often you test and whether there are certain areas or times where extra attention might be needed. How you go about this will be fully covered in the raw milk workshops, see more on p7.

New FSA Pathogen Testing

All RCDM producers should note that from June 2019 the FSA will be implementing new microbiological testing controls. Samples taken by DHIs will be tested for all pathogens, including STEC, on a six-monthly basis. The tests will be performed at the Public Health England laboratory. Producers should keep the results of these tests in their documentation and they can be used as part of the validation of their FSMS.

Raw milk producers will be required to have a Food Safety Management System soon



Kees feeding his out-wintered cows

Stroud Micro Dairy

KEES & ALICE FREDERICKS TELL US ABOUT THEIR NEWLY ESTABLISHED COMMUNITY SUPPORTED MICRO-DAIRY SELLING RAW MILK, WILD YOGHURT AND KEFIR TO THEIR MEMBERS

Farm Facts

Farm Size:	60 acres
Manpower:	2
Farm Type:	Grassland
Number of Livestock:	9 cows in milk plus followers
Tenure:	Rented
Region:	South West
Soil:	Cotswold Brash
Key Farming Practices:	Mob grazing, cow-calf dairying
Milk selling price:	£1.75/L
Products:	Raw drinking milk, wild yoghurt and kefir



Raw Milk Producers Association

Kees Frederiks together with his wife Alice, founded Stroud Micro Dairy on 2 February 2017. Their raw milk outlet is perched on the top of a hill at Oakbrook Farm, just outside the bustling town of Stroud, in Gloucestershire. The farm was bought by the community of Stroud and is held in trust, to be used to help young farmers get a start in the industry. Community Supported Agriculture (CSA) projects such as this are a partnership between farmers and consumers in which the rewards, risks and responsibilities are shared.

Kees' agricultural background is diverse – his initial dairying experience comes from

and enough for everyone to have their share. Members are allocated their own glass milk bottles and collect the milk themselves from the home-made milk dispensing machine, which was cleverly engineered by Kees and his brother. Any spare yoghurt, kefir and milk is paid for via an honesty box in the shop, which can only be accessed by members who are given the entry code.

When people first join as members they are given an induction into how the CSA works and learn not only about the benefits of raw milk, but also the key things such as how to effectively clean the reusable glass bottles. There is very much

In two short years, Kees and Alice have gained 230 members, selling 98% of the milk produced as raw drinking milk, yoghurt and kefir, all from the farm gate

milking bail, with milk heading straight into a small bulk tank via a plate cooler, which Kees reckons to be their best investment yet. The plate cooler has had a big impact not only on improved shelf life due to rapid cooling time, but also for peace of mind, particularly during the long hot summer of 2018.

Cows are milked once a day, with 9 being in the system currently, meaning production is around 100L/day. Calves stay with their dams for the first couple of months followed by a month where they are allowed to suckle once a day to ease their transition to independence. At weaning the heifers stay to eventually join the herd, and the steers go to the neighbouring farm run by Stroud Community Agriculture to live the life of a beef animal.

Kees has found his FSA dairy hygiene inspector and local authority environmental health officer to be very supportive, and he involved them from the start when setting up the micro dairy. The dairy is able to support one and a half full time workers, plus Kees on around 20 hours per week, which has enabled him to spend time with his wife Alice, and young son, Bas.

When asked for his top tips for new entrants to the world of raw milk, Kees advised that the best thing anyone can do is to go and visit as many raw milk producers as possible, as this will give you the highest chance of finding a system that will suit you.

To find out more about Stroud Micro Dairy visit: www.stroudmicrodairy.co.uk



Cows are milked OAD and raise their own calves

his father's 450 cow enterprise in Wexford, based on the New Zealand system, but Kees travelled extensively before working on community-based projects in Lambeth, and latterly moving to Stroud in 2017.

In two short years, Kees and Alice have gained 230 members (having started with only 40 by the end of their opening party), selling 98% of the milk produced as raw drinking milk, yoghurt and kefir, all from the farm gate. The remaining 2% being kefir that is sold at specialist wholefoods shops in Stroud and nearby Cheltenham.

The membership system is straightforward – each member signs up for a 52 week share of raw milk and yoghurt or kefir and pays 13 weeks in advance via an online subscription platform. Specific collection days are agreed upon in order to ensure that there is a good flow of produce

the feeling that the project is a collective endeavour – if the system falls down, everyone will lose out and members truly appreciate the level of responsibility that they are given.

The cows are largely New Zealand genetics and a mixture of Jersey x Friesian, which makes them quite hardy and able to keep condition on, which is essential as they live out all year round. Some Guernsey genetics have been introduced, then back to Kiwi cross, to encourage a good level of hybrid vigour. There is a desire to become completely pasture-fed and several herbal leys have been introduced, but the maintenance requirements of the animals have made it quite hard, so some feed is used at milking time.

The milking parlour is fully outside in a

Shelf-life Testing

In the first of a series of 'how to' articles, one producer explains how they perform their raw cows' milk shelf-life testing and shares some recommendations that other producers may wish to consider.

Christine Page | Smiling Tree Farm

Shelf-life testing is important not just to reassure consumers that the milk is safe to consume up to the point of its Use By date, but also to set an expectation for the consumer on how long it should taste good. Thus, there are two elements to consider when establishing the shelf-life of raw drinking milk:

1. That it is free from pathogens at levels likely to cause harm
2. That the organoleptic (taste & smell) properties remain per consumer expectation

The process of establishing durability for raw drinking milk should only be started once a Food Safety Management System (FSMS), based on HACCP principles, has been set up and at least one set of compliant microbiological tests, for both hygiene indicator organisms and pathogens, at end of production has been undertaken.

Organoleptic Tests

Once you feel comfortable that you have established good hygiene and control processes and your initial microbiological tests have validated your FSMS, then start by doing your own simple organoleptic

tests to give you an idea of longevity. Milk your cows and bottle your milk as if for sale, with no special precautions. Put five or more bottles of this milk in your domestic fridge, to represent how the consumer might keep it.

Three days later take out one of the bottles, shake it gently to mix the cream. Pour a nice cold glass and have a taste, sommelier style: warm it in your mouth, swill it around your cheeks and over your tongue, feel the viscosity then swallow. Make a note of the taste and smell. Immediately, do the same with a glass of fresh milk from that morning's milking, chilled to the same temperature. See if you can detect any difference between the two. Sip back and forth between the two glasses – do they taste, smell, feel the same in your mouth?

Repeat this process over the following days, always comparing to a bottle of fresh milk from that day's milking chilled to the same temperature. It is standard practice to include on milk bottle labels "once opened consume within 3 days" to take account of the temperature variations of domestic removal and replacement of bottles from the fridge. However, for the purposes of shelf-life testing you are aiming to find the maximum durability of an

unopened bottle. So, once opened, do not reuse that same bottle for organoleptic testing on a subsequent day, always open one of the other bottles stored from the first day.

At some point you'll start to notice a change. This can be due to souring as a result of lactose-fermenting organisms gradually turn the milk sugars into lactic acid, or as a result of spoilage organisms such as *Pseudomonas*. That may be on day

Pseudomonas are cold tolerant spoilage organisms which can be introduced from mains water in the milking machine or on the bottling line

4, or 5, or 7, or even day 10. Whichever day it is, use the prior day as your shelf-life target. For example, if you notice the flavour deteriorating on day 6, then use 5 days as your target Use By date for your subsequent lab tests. To obtain an accurate picture, repeat your organoleptic tests several times and with milk taken from different days of the week, especially on days when the cows may be milked by occasional or relief staff.

pH Testing

To add a little more science to your home trial, measure the pH of your milk each day when you do your organoleptic tests. Fresh milk, once chilled to 4C should be around pH 6.6. Jot down the pH each day, along with your tasting notes. The pH will drop in line with the speed at which lactose is turned into lactic acid: the more lactose-fermenting organisms in the milk, the faster the milk will sour.

Although raw milk inherently contains lactose-fermenting organisms, many of which are the beneficial sort that are fairly lethargic at fridge temperature, some spoilage ones are introduced by faecal

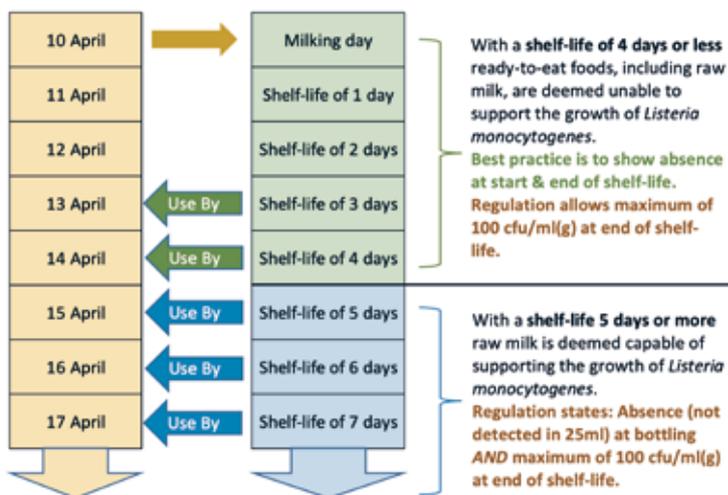


Figure 1

Raw Milk Producers Association

contamination: *the more shit in the milk, the faster it will go off!*

Other non-lactose fermenting organisms, such as *Pseudomonas*, will affect quality without lowering the pH. Faecal contamination also increases the chances of pathogenic bacteria being present, which would put the safety of the product at risk. Thus, a FSMS should not only select for cows with the best health status, but also prioritise processes that reduce faecal contamination, and ideally eliminate it to as great an extent as is possible. You can buy pH sticks which are easy to use but not so accurate as a pH meter. If you use a pH meter ensure you calibrate it before every use. Health status and diet of the cows can affect the pH reading, so it's useful to get to know what reading to expect, as it's a good indicator of something being amiss.

Lab Tests

It is not possible to justify safety on the organoleptic inspection alone. Having established a target shelf-life from the organoleptic and pH testing repeated over several different batches of milk, the next step is to verify this with lab tests.

It's important to note that *Listeria monocytogenes* can grow at fridge temperatures. Therefore, regulation states

different thresholds depending on shelf-life, see Fig 1.

If you are selling milk destined for pasteurisation, then your regular milk testing schedule is likely to include tests performed by your milk purchaser for somatic cell count (SCC) and bactoscan. These test results can be used to meet some of the respective FSA controls for the sale of raw cows' drinking milk. However, as best practice it is strongly advised that raw drinking milk should not be syphoned off from the bulk tank, but should be produced from the healthiest cows in the herd and stored separately under strict hygienic conditions. This milk should be tested separately for coliforms, TVC and pathogens to demonstrate that your FSMS is effective.

It is important to remember that risk is controlled through processes, not tests. The tests are just validating the control processes are working. Understanding risks and putting in place mitigating control processes and validating those controls is what leads to greater safety. Your documented organoleptic and pH tests should satisfy the requirement to meet consumer expectation for taste and smell. To validate your FSMS supports the desired durability, you will need to have

microbiological tests done at a laboratory at the maximum shelf-life date. Thus, if you propose a 6-day shelf-life you need to arrange to get milk samples to a lab to get the tests done on (or after) day 6.

Currently, *Listeria monocytogenes* is the only pathogen that is required to be tested for at the end of shelf-life, as all other pathogens are deemed unable to grow at fridge temperatures. However, as you have no control over how your customers may keep the milk, especially if travelling a distance home in a warm car after collection from your farm, it is recommended to test for all pathogens, as listed below, at the end of shelf-life.

Milk composition and production risks can change through the seasons for most producers and this can affect its durability. It is, therefore, a good idea to repeat your organoleptic and pH tests at regular intervals through the year, particularly at times of significant change to the diet or management of your herd, such as after housing or at turn-out, and reconfirm the shelf-life of your raw milk through further lab tests. Gathering results over time ensures that they are reflective of the milk quality all the time and not just a one-off.

FOOD SAFETY TEST	Criteria at end of shelf-life	Approx cost*
<i>Salmonella</i> spp	absence in 25ml	£6
<i>Campylobacter</i> spp	absence in 25ml	£6
<i>E.coli</i> 0157:H7	absence in 25ml	£22
<i>Listeria monocytogenes</i>	<100 cfu/ml	£6
Coagulase positive staphylococci	≤20 cfu/ml	£9
APPROX TOTAL COST		£49

*Costs based on prices from National Milk Laboratories

cfu = colony forming units

< = less than

≤ = equal to or less than

Raw Milk Workshops

Don't miss the raw milk workshops, on **6 & 7 June**, with world leading raw milk experts **Dr Cat Berge & Prof Dr Ton Baars** aimed at all RDM producers and those processing raw milk products. The workshops, full of invaluable information that has never been available in this way in the UK before, will give those who attend an advantage not just in the production of safe raw milk but in navigating the new regulatory controls. The sessions will cover: History & health benefits; health hazards; herd health & hygienic production; impact of feed & environment; developing a farm specific raw milk safety plan and testing. **The last session will be a presentation by Charles Boundy, lead DHI, on the new FSA controls requirements, followed by a Q&A panel.** See the home page of www.rawmilkproducers.co.uk for more information and to book your place.

Membership

The RMPA is a not-for-profit co-operative society, owned and run by its members, raw milk producers, who are also shareholders.

Our Objects are to:

- Facilitate communication and collaboration between raw milk producers
- Promote best practice in raw milk production and consumer safety
- Disseminate up-to-date advice and guidance relating to raw milk production and associated legislation and technical information
- Promote the interests of raw milk producers in working with regulators and other external bodies
- Undertake any other activities with the aim of supporting raw milk producers and consumers, including guiding new producers through the registration process and establishing good practice

There are two types of membership of the RMPA. Full Membership is open to all current and soon-to-be raw milk producers selling raw drinking milk direct to consumers. Full Members are also shareholders (£1 shares) of the co-operative.

Associate Membership of the RMPA is open to anyone with an active role in an associated field, business or organisation that is related to the production of raw drinking milk. Associate Members have access to all the same benefits of membership as a Full Member, and pay the same membership fee. However, an Associate Membership is a non-shareholding, non-voting subscription.

Benefits of Membership:

- Participate in the members thriving **online forum**
- Attend **raw milk workshops** with world-leading experts at a discounted rate
- **Guidance booklets** on safe production of raw milk written by experts in RDM and approved by the FSA to help you meet the new FSA controls
- A quarterly **newsletter**
- Attend **farm tours**
- **Discounts** on dairy equipment, bottles and consumables through the RMPA affiliate programme
- Have your farm listed on the RMPA **Where to Buy map** with a link direct to your website or social media page
- Use of the RMPA **Member logo** on printed & electronic media
- Already RMPA members combined represent half of the UK sales of raw milk and all benefit from our collective voice having more strength in working constructively with the regulator now and in the future
- You also benefit from the work of the **RMPA committee** who are all RDM producers taking time out of their busy days, on a completely voluntary basis, to bring this organisation together to help their fellow producers



Annual membership subscription is £100. To become a member go to www.rawmilkproducers.co.uk/membership

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Annual General Meeting

SAVE THE DATE

The first RMPA AGM will be held on **6 Sept 2019** at **Fen Farm Dairy, Suffolk** and include a farm tour with an excursion to **Old Hall Farm Dairy**.

Full details in next newsletter.