Milk Quality Ireland Co-operative Society Overview

Teagasc Milk Quality Workshop

January 2023

Milk Quality Ireland

About us:

- Established in 1989 to improve standards of installation, servicing and testing of milking machines.
- In recent years, MQI have focused on broader areas of milk quality as well as providing training and certification of milking machine technicians.
- Formerly known as IMQCS (Irish Milk Quality Co-op Society).

Milk Quality Ireland

Mission Statement:

1. To improve milk quality standards in Ireland and to arrange for the provision of whatever services and initiatives are required to achieve this.

2. To provide or arrange for the provision of any service or services which may be for the benefit of the members and others including the arranging of suitable training and certification programmes in milking machine testing and installation for personnel involved with the dairy industry.

3. To ensure that Irish milking machine installation and testing standards equate with the best international practice.

MQI COMMITTEE STRUCTURE

Milk Quality Ireland

Structure:

- Committee of Management
  - ICOS x 2;
  - Dairy Co-ops x 5;
  - Milking machine manufactures x 2;
  - Technicians register x 2;
  - Teagasc x 3.
- ICOS provide a Chairman and Secretary.
- Teagasc carries our training programme.

Milk Quality Ireland

Committee of Management:

Committee of Management – Meetings approx. 4 times per year.

Members of The Committee:

Chairman – Vivian Buttimer, ICOS Board.
Secretary – Mr. Eamonn Farrell, ICOS.
Mr. Jerry Cronin & Ms. Fionnuala Malone – Tirlán Co-op.
Mr. Hugh Holland - Barryroe Co-op.
Mr. Laurence Shalloo - Teagasc.
Mr. Seamus Goggin - Technician Representative.
Mr. John Daly - Dairymaster.
Mr. Eamon Duignan - Lakeland Dairies.
Mr. John Upton - Teagasc.
Mr. William Ryan - Dairygold Co-op.
Mr. Ciaran Murphy - DeLaval.
Mr. Sean Reid - Technician Representative.
Mr. Francis Quigley - Teagasc.
Mr. James O'Connell - Kerry Agribusiness.

Committee of Management

Some examples of recent activities:

- Establishment of a new traineeship for milking machine technicians to support new entrants into the sector.
- Focus on key milk quality issues such as the removal of chlorine from dairy farm wash routines and the promotion of milk recording & transition to selective dry cow therapy.
- Focus on energy efficiency and provision of three phase power at farm level to support overall sustainability goals of the dairy sector.
- Discussions with DAFM on the grant aid specifications for milking machines under TAMS II.
- Preparation of detailed submissions to DAFM in support of a new dairy equipment scheme within Ireland's CAP Strategic Plan.
- Purpose built demonstration milking machine room located in Kildalton College
- Regular training and education activities.

Register of Milking Machine Technicians

- MQI maintains a register of trained and certified milking machine technicians.
- Currently there are 270 members on the technician register.
- Attendance at a CPD refresher course is mandatory to maintain membership.
- http://www.milkquality.ie/documents/IMQCS_Website_Information.pdf

TRAINING & EDUCATION

Certified Testing Course

- The course covers installation and testing of milking machines to ISO standards;
- One or Two courses per year; a maximum of 16 participants are allowed per course;
- Training open to milking machine technicians, milk quality advisors, Teagasc staff and other professionals;
- Course assessment involves an exam (online) and practical.

Certified Testing Course

MILK QUALITY IRELAND CERTIFIED TRAINING PROGRAMME IN MILKING MACHINES

The training programme is targeted at all industry personnel who aim to achieve certification in milking machine testing and installation and have their names listed on the Milk Quality Ireland directory of milking machine testers and installers. The programme is also beneficial to personnel of the co-operatives and Teagasc working with all aspects of milk quality but in particular aiming to achieve a full appreciation of the influence milking machine technology has on milk quality.

Teagasc
Agriculture and Food Development Authority

LOCATION:
TEAGASC KILDALTON COLLEGE,
TEAGASC MOOREPARK RESEARCH CENTRE

TIMETABLE

DRAFT OUTLINE
SUBJECT TO CHANGE

7 DAY COURSE RUN OVER 2 WEEKS

WEEK 1
DAY 1 THEORY/ PRACTICALS -KILDALTON COLLEGE
DAY 2 THEORY/ PRACTICALS -KILDALTON COLLEGE
DAY 3 THEORY/ PRACTICALS -KILDALTON COLLEGE

WEEK 2
DAY 4 THEORY- MOOREPARK RESEARCH CENTRE,
DAY 5 THEORY/ PRACTICALS -KILDALTON COLLEGE
DAY 6 PRACTICALS -KILDALTON COLLEGE

DAY 7 EXAM - KILDALTON COLLEGE

9:30AM- 4.30PM EACH DAY (SUBJECT TO CHANGE)

TOPICS

- Theory of milking machines, outline the role of different machine components
- Installation standards and visual checking. ISO standards
- Operation of airflow meters, care and maintenance
- Measurement of vacuum and reserve.
- Measurement of pulsation characteristics using a pulsation analyser.
- Fault diagnostic in pulsation system.
- Preparation of test reports
- Milking Machine Research update.
- Mastitis, cell counts, prevention and treatment
- AHI Cell Check programme
- Research update on cleaning milking equipment, cleaning products and teat dips
- Research into milk residues, Iodine, TCM etc.
- Health and safety around testing of milking equipment.
- Non routine tests, fault diagnostics, stray voltage.
- Course Assessment Practical and online theory exam on the last day.

The course is suitable for people with all levels of experience. We cover each of the topics starting from a basic level so even people who are new to the area of milking equipment will be able to complete the course. We run one or two courses per year with a maximum of 16 participants. Usually we have a range of milking machine technicians, milk quality advisors, dairy advisors, veterinarians etc. attending each course.

For further course information contact <francis.quigley@teagasc.ie>

Course Fee
The cost per person is €750. However ICOS Skillnet Funding is available, at 20% and Teagasc contribution means that course fee for participants is reduced to €375 per person.

Booking details

Contact - Eamon Farrell - eamonn.farrell@icos.ie 01-6131343
www.MilkQuality.ie

Refresher Training

Refresher Training

Livestock

(01) 419 9530
livestock@farmersjournal.ie
@FJdairy @FJbeef @FJsheep

Residues sorted but new issues emerge

Last week, Milk Quality Ireland – an offshoot of ICOS – held training days for milking machine technicians. **Aidan Brennan** reports the key messages from the Cork meeting

Two years ago, Ireland was the first country in the world to implement an outright ban on chlorine-based wash routines in milking machines and in milk processing plants.

While the transition hasn't been without its challenges, Teagasc researcher Bernadette O'Brien said it has been very successful from a chlorine residues perspective.

Trichloromethane (TCM) residue from chlorine is a known carcinogenic and can be an issue in butter as the residue binds to milk fat.

The target is 0.000124mg/kg while the average TCM residue for Irish milk is now almost half that at 0.00079mg/kg. Chlorate is another chlorine residue problem, which is linked to iodine deficiency in humans and especially babies, so chlorates in infant milk formula is a concern. Last year, chlorate could not be detected in 92% of all bulk tank milk samples across 3,500 farms.

With chlorine no longer available as a detergent steriliser, keeping milking machines and bulk tanks free of bacterial growth is a bigger challenge for farmers and milk quality advisers. This is because chlorine is an extremely effective cleaning product, so replacing it is difficult.

If the wash routine wasn't good enough there would be a buildup of scum on the claw piecers. Liosai O'Leary

According to Teagasc researcher David Gleeson, the effectiveness of chlorine meant that it masked a lot of underlying cleaning problems and with chlorine no longer being used, some of these problems are coming to light.

The main bacterial challenges are thermoduric bacteria (THD) and total bacterial counts (TBC). Of these, thermoduric bacteria is more problematic because they can survive the pasteurisation process.

David says that cleaning routines have to change in order to compensate for the loss of chlorine.

"It's not just a case of changing drums and carry on as normal, many farmers went from using chlorine-based detergents to chlorine-free detergents without altering the settings on automatic machines or how much they put into the wash trough.

"The amount of caustic in these products is much higher than chlorine-based products so they are much slower to suck up, meaning in most cases the machine is not getting enough product. It's simple things that are causing most problems," he says.

Products

There are two products needed to keep milking machines and bulk tanks clean. Detergents, such as sodium hydroxide (caustic), are available in liquid or powder form and are used to remove milk residues from the milk line. Acid is used to clean mineral deposits in the milk line. These mineral deposits are formed by water, so farmers in hard-water areas need to do more acid washes. Many farmers are now installing water softeners to reduce the hardness of water before it is used for washing.

Having sufficient amounts of hot water for the wash cycle is a crucial part of keeping the plant clean.

David says that it doesn't matter what method is used to heat water, or how hot the water is after it comes out of the boiler; the key metric is how hot the water is at the start and at the end of the wash cycle.

"Measuring the temperature of the water coming out of the tap means nothing because it often takes so long for the wash trough to fill that the water has cooled before the wash starts.

"Another common problem is that the wash goes on for too long. This means that the water gets too cold and the particles that have been removed get reabsorbed on to the pipework. The target is for the wash cycle to last eight to 10 minutes. Anything longer than that is too long."

Pre-wash rinse

He also said that many farmers are now using a pre-wash rinse with hot water to warm the pipes prior to the main wash cycle. This means that the wash cycle doesn't lose as much heat during the wash.

He said they are doing this either by using the plate cooler water to rinse the plant after milking, dumping the first 50l to 70l of the hot wash cycle before adding detergent, doing a warm post-milking rinse with water at 30°C to 35°C, or programming this warm rinse into the wash programme for automatic washers.

Using fast fill ballcocks and using lids and insulating wash troughs will help to maintain temperature of the water for longer. He said the target temperature for the start of the wash is 75°C to 80°C and 45°C to 55°C for the end of the wash.

In short

- Chlorine residues are no longer a concern in Irish dairy products since the entire industry moved away from chlorine-based wash routines.
- Chlorine-based detergent steriliser masked a lot of problems with cleaning technique but with chlorine no longer available some of these issues are re-emerging.
- New wash routines using more hot washes and extra products are required to keep milking parlours and bulk tanks clean when using chlorine-free products.

Poor practice is common

David Gleeson said that he's currently doing a study of milk quality on 100 dairy farms, 50 with good milk TBC and 50 with poor TBC, to see if there are trends between the good and the bad.

He has 60 farms surveyed to date and he said that every farm is doing some incorrect practices, even those with the good milk quality results.

Examples of some of the issues encountered are:

- Products out of date such as acid drum expired.
- Detergent usage is half the rate required.
- No detergent used after the evening milking.
- Liquid detergent re-used.
- Detergent products sitting in the sun.
- Drum without label and no idea what the product is.
- Has run out of detergent for days.
- Long hot detergent wash cycles of 15 to 20 minutes.
- Same product levels used for both hot and cold circulation.
- No acid used.
- Wrong tubes in detergent/acid drums.
- Peracetic acid drum open and in use for 10 months.
- Double the amount of peracetic acid that should be used.
- Detergent steriliser (chlorine) products in use.
- No hot water used.
- Water supply issue, meaning cleaning takes a lot longer than it should.
- Wash trough is only half the size required.
- Low water levels for main wash cycle (5l per unit when it should 9l).
- Wash water start temperature less than 50°C for liquid products.
- Hard water issue with a stain on trough surfaces.
- Poor drainage after wash cycles impacted on hot wash temperature and residues.
- Filter sock left in without rinsing for the full wash cycle and then replaced.
- **No filter sock present for the wash** cycle could clog the plate cooler.
- Clusters mounted for washing in wrong position.

The wash programme needs to include detergent to clean milk residues and acid to clean mineral deposits from water.

> Keeping milking machines and bulk tanks free of bacterial growth is a challenge for farmers and milk quality advisers

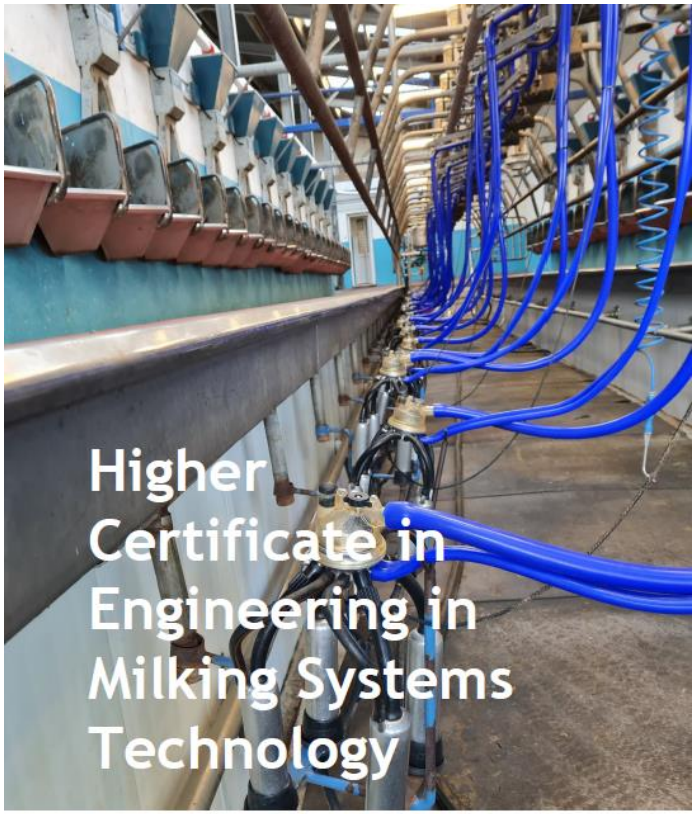
Think of milk meters

Kevin O'Neill, head of milk recording at Progressive Genetics, and Francis Quigley, milking machine specialist with Teagasc, spoke about the importance of correctly positioning milk meters on rotary milking parlours.

There are numerous health and safety risks when working around rotaries and more thought needs to be put into where the DIY milk meters will go for operator safety and to avoid damaging the meters.

Kevin said that only ICAR-approved milk recording devices can be used when milk recording but that many farmers install milk yield sensors thinking that they will comply but they don't.

New Milking Machine Traineeship



- 2-year part time traineeship
- Higher Certificate in Engineering in Milking Systems Technology
- Partnership between TUD, Teagasc, MQI & ICOS Skillnet
- 120 Credits in Total

RESOURCES & MATERIALS

Milk Quality Ireland

Website:

www.milkquality.ie

Milk Quality Ireland

Materials:

1. Teagasc/IMQCS Recommendations for the installation and the testing of milking machines;

2. IMQCS Milking Machine Test Report;

3. IMQCS Service Checklist

Test report books and the service checklist are supplied free of charge.

Test Report & Service Checklist

IMQCS MILKING MACHINE TEST REPORT

Name_____ Address_____

_____ Date_____ Plant Type_____

No. of units_____ Tester's Signature_____ IMQCS Reg. no._____

Vacuum and Airflow Tests

1. **Working vacuum at Vm; machine in the milking position (liners plugged)** ____ **kPa**
   Working vacuum recommended with the machine in the milking position (liners plugged) ____ kPa
1a. Working vacuum at Vr; machine in the milking position (liners plugged) ____ kPa
1b. Working vacuum at Vp; machine in the milking position (liners plugged) ____ kPa
1c. Vacuum in the milking system at Vm; machine ready for milking ____ **kPa**
1d. Plant gauge vacuum level; machine ready for milking ____ **kPa**
1e. Vacuum near plant vacuum gauge at Vr; machine ready for milking ____ **kPa**
Plant vacuum gauge accuracy (1d-1e) ____ **kPa**
2. Pump capacity; AFM direct to pump, test gauge at Vp ____ l/min
2a. Pump capacity at 50kPa; AFM direct to pump, test gauge at Vp ____ l/min
2b. Pump speed ____ rpm
Estimated pump capacity required ____ l/min
3. Airflow with vacuum system; machine in the milking position (liners plugged), airline only added, regulator(s) plugged, test at A2 and Vr or Vp ____ l/min
Airline leakage (2-3) ____ l/min
4. Airflow with milk system added; machine in the milking position (liners plugged), close claw air admission; test at A2 and Vr or Vp ____ l/min
Milking system leakage (3-4) ____ l/min
5. Airflow with air admission at claws open; machine in the milking position (liners plugged), test at A2 and Vr or Vp ____ l/min
Claw air admission (4-5) ____ l/min
6. Airflow with ancillary equipment connected to milkline added, machine in the milking position (liners plugged), test at A2 and Vr or Vp ____ l/min
Milking system ancillary equipment usage (5-6) ____ l/min
7. Airflow with pulsators added; machine in the milking position (liners plugged), test at A2 and Vr or Vp ____ l/min
Pulsation usage (6-7) ____ l/min
8. Airflow with ancillary equipment connected to airline added; machine in the milking position (liners plugged), test at A2 and Vr or Vp ____ l/min
Airline ancillary equipment usage (7-8) ____ l/min
9. Manual reserve; machine in the milking position (liners plugged), regulator(s) plugged, drop vacuum 2kPa below no. 1, test at A1 and Vm ____ **l/min**
10. Effective reserve; machine in the milking position (liners plugged), add regulator(s), drop vacuum 2kPa below no. 1, test at A1 and Vm ____ **l/min**
Regulation loss (9-10) ____ **l/min**
Required effective reserve ____ l/min
Required cleaning reserve ____ l/min
11. Regulation sensitivity (1c-1) ____ kPa
12. Exhaust back pressure (positive pressure); test gauge at Pe ____ kPa
13. Fall-off/attachment vacuum drop; open one unit per 32 units ____ kPa
14. Regulation undershoot ____ kPa
15. Regulation overshoot ____ kPa
16. Airflow without regulator(s); machine in the milking position (liners plugged), regulator(s) plugged, drop vacuum 2kPa below 1a, test at A1 and Vr ____ **l/min**
17. Airflow with regulator(s); machine in the milking position (liners plugged), add regulator(s), drop vacuum 2kPa below 1a, test at A1 and Vr ____ **l/min**
Regulator leakage (16-17) ____ **l/min**

Pulsation Tests

Rate c/min **Max**_____ **Min**_____
Ratio "a+b" % or ms **Max**_____ **Min**_____
"a" value % or ms **Max**_____ **Min**_____
"b" value % or ms **Max**_____ **Min**_____
"c" value % or ms **Max**_____ **Min**_____
"d" value % or ms **Max**_____ **Min**_____

Pulsation graphs attached: yes/no _____
Simultaneous or Alternate _____
Limping (< 5%) _____

Liners

Make and identification no. _____
Next liner change due _____

Faults

Recommendations

N.B. Items in Bold Type must always be filled in. Tests 13, 14, and 15 may be completed instead of test number 10 for machines with 14 or more units.
It is recommended that milking machines be tested at least twice per year.

IMQCS - www.milkquality.ie

Revision 1.

IMQCS SERVICE CHECKLIST

Name_____ Address_____

_____ Date_____ Plant Type_____

No. of units_____ Tester's Signature_____ IMQCS Reg. no._____

Item Checked	Correct		Rectified	
	Yes	No	Yes	No
Test Points				
Are test points and calibrator valves for measuring airflow and vacuum present and correct?				
Vacuum Pump				
Is the belt guard fitted and in good condition?				
Is the pump receiving correct oil and adequate lubrication?				
Are the belts and pulleys tight, aligned and in good condition?				
Do safety issues with belt guards, motor rotation/safety switches, etc?				
Interceptor				
Is gasket on lid satisfactory?				
Is automatic drain valve present and functioning correctly?				
Does the interceptor appear to be clean?				
Is the shut-off float functioning correctly?				
Drain valve NOT discharging on other equipment?				
Main Airline				
Is the main airline clean internally?				
Is there an adequate continuous fall in the main airline and in the correct direction towards a drain?				
Is the main airline rigidly fixed?				
Are restrictions at interceptor or ancillary trap?				
Vacuum Regulator				
Are the air intake, valve and valve seating clean?				
Are the diaphragms in good condition?				
Was a service kit fitted?				
Is the regulator rigid and upright?				
Is the regulator correctly located for satisfactory operation and easy access?				
Sanitary Trap				
Is gasket on lid satisfactory?				
Does the sanitary trap appear to be clean?				
Is drain sanitary trap valve functioning correctly?				
Is the shut-off float functioning correctly?				
Pulsator Airline				
Is the automatic drain valve present and functioning correctly?				
Is the pulsator airline clean internally?				
Is there an adequate continuous fall in the pulsator airline and in the correct direction?				
Is pulsator airline rigidly fixed?				
Is there a tap at the end of the pulsator airline for washing purposes?				
Pulsation				
Are pulsators/relays clean?				
Have the pulsation relay kits been changed according to service intervals?				
Is the clean airline present and functioning correctly?				
Are filters on air supply to relays clean and free from unnecessary restrictions?				
Is the clean airline free from debris and excessive moisture?				
Are pulsators and relay tubes in good condition and without extra knots or leaks?				
Are electrical connections in good condition and free from corrosion?				
Rubber Tubing Conditions				
Are long milk tubes satisfactory?				
Are long pulse tubes satisfactory and free from excessive loops?				
Are short pulse tubes satisfactory?				
Are long and short airline tubes satisfactory?				
Are tubes to cluster removers satisfactory?				
Are milk transfer tubes from recorder jars satisfactory?				
Is other rubberware satisfactory?				
Is rubber tubing without metal bond?				
Long Pulse Tube Rises				
Minimum - at least 1 mm?				
Simultaneous - at least 8.5 mm?				
Claws				
Are claws clean internally?				
Are the air admission holes fully opened?				
Are claw bowls, gaskets, nipples and shut-off valves satisfactory?				
Have the claw seal kits been changed at service intervals?				
Are all claw bowls free from cracks?				

Item Checked	Correct		Rectified	
	Yes	No	Yes	No
Liners				
Have the liners been changed at recommended intervals (2000 cow milkings)?				
Are there no holes or cracks in liners or short milk tubes?				
Are the anti-twist indicators aligned correctly?				
Are liners suitable for the shells?				
Are liners approved (original or copies)?				
Long Milk Tubes				
Are long milk tubes free from excessive bends?				
Is the bore at least 13mm but not greater than 15mm?				
Milkline				
Milkline enters into the top or top third of milkline and aligned correctly?				
Is there an adequate continuous fall in the milkline towards the receiver?				
Has the milkline remained at right height and rigidly supported?				
Is drainage tap at each low point working satisfactorily?				
If compressed air is used to purge milkline is filtered air used?				
Receiver Jars				
Are receiving jars free from leaks?				
Are the hand controls functioning correctly?				
Are sprinklers present, correct and free of obstructions?				
Are other valves/rubber parts in good condition?				
Automatic Cluster Removers (ACR's)				
Are cars/ pails seating correctly? i.e. adequate pulling power in the cars				
Are the ACR cards in good condition?				
Does the vacuum shut off when the ACR is in the off position?				
Are ACR's serviced and tested according to the unit's manual?				
Milk Meters				
Are the valves/diaphragms in good condition?				
Has a service kit been fitted?				
Have the meters been calibrated?				
Drive/can Valves				
Have the diaphragms been changed in accordance with the recommended service intervals?				
Centrifugal Milk Pump				
Has a non-vair kit/non-return valve fitted?				
Is the non-return valve in good condition?				
Is the sealing in good condition?				
Are all unions and joints tight and leak free?				
Positive Milk Pump				
Are belts tight and in good condition?				
Are pulleys right, aligned and in good condition?				
Is there adequate oil in pump on arrival?				
Is the pump timed correctly?				
Record strokes per minute				
Are non-return valves ok?				
Manual/fixed/semi/variable speed working correctly?				
Is diaphragm(s) in good condition?				
Are all unions and joints tight and leak free?				
Vacuum Gauge				
Is vacuum gauge milkline during milking?				
Is the vacuum gauge reading zero when stopped?				
Is the vol pointer set to the recommended vacuum level?				
Washline				
Are entries into washline into the top or top third?				
Others				
Are prime manifolds clean and without obstructions?				
Automatics				
Are autowasher tubes and pumps in good condition?				
Is the autowasher functioning to the manufacturer's guidelines?				
Has the autowasher been calibrated for dosing volume?				

Milk Quality Tips: Service equipment regularly • Change liners on time • Maintain excellent hygiene of cows and equipment • Always teat dip all cows • Ensure proper milk filtration and cooling

Milk Quality Ireland

Milking machine training facility in Kildalton:

Sustainable Dairy Assurance Scheme

SDAS & Milking Equipment (Section 3.18):

a) Milking equipment (tanks, pumps, pipes, tubes, etc.) must be constructed / fitted and maintained so that all surfaces in contact with the raw milk can be cleaned using normal dairy detergents and sanitisers.

b) The milking machine must be tested by an IMQCS[9] registered milk technician at a frequency to be determined by the Producer based on milk quality data and performance of the equipment.

c) Records of these tests and the corrective actions taken must be maintained.

d) The Producer must have a routine for checking and replacing / servicing all equipment that could affect milk quality or animal health (including teat-cup liners for damage; pipework for leaks; milking pumps and pulsation system for effective operation; etc.).

e) All mechanical, electrical and automatic equipment must be monitored daily to ensure effective operation and to prevent injury to personnel or the cows.

TAMS II /On farm Capital Investment Scheme

Certificate of Testing:

Cert of Testing

[Certificate to be typed on Installers Headed Paper]

CERTIFICATE OF INSTALLATION AND TESTING OF NEW MILKING EQUIPMENT

I, *(name of person carrying out the test)* am currently listed on the IMQCS register and my registration number is *IMQCS registration number*. I confirm that new milking equipment has been installed and tested in accordance with industry-established procedures on the farm of:

Name of Client: _____

Address: _____

_____

_____

_____

I have written the results of the test on an IMQCS test report sheet and the results meet the accepted norms for this particular milking machine. The test took place on *date of test* and copy of the test report was given to the client.

Signed: _____ (Person performing test, as named above.)

Date: _____

AHI CellCheck Guidelines

GUIDELINE

25 Test, service and upgrade milking machines

- Service twice a year
- IMQCS technician
- Written test report
- Carry out recommendations

Virtually all infections enter the udder through the teat openings. Your milking machine spends 50-100 hours attached to each teat in lactation. Machine malfunctions can cause teat damage and increase the risk of infection.

25.1 Fully test and service your milking machine twice a year

In addition, it should be monitored, tested and adjusted as often as necessary during lactation.

25.2 Use a milking machine technician who tests to IMQCS standards

Make sure the technician performs the tests according to IMQCS standards and the technician should preferably have a current IMQCS qualification (or equivalent). Confirm this before making the booking.

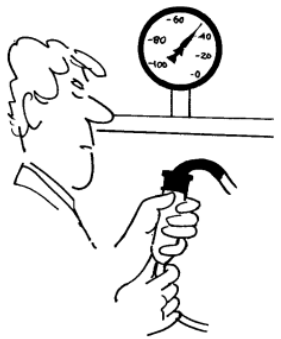
Refer to Guideline 6
Maintain and monitor milking machine function.

Refer to Management Note H
IMQCS milking machine test reports.

TRAP

Don't rely only on the routine service
Immediate additional testing and service is recommended if any of the following are observed:

- Cows appear to milk slowly or incompletely.
- Clusters slip or fall off frequently.
- Teat condition is poor.
- Cows appear nervous or uncomfortable.



REVIEW AND PLANNING

New App & Sticker

https://eu.jotform.com/app/milk-quality-ireland/mqi

Thank you

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