

NOTES FOR COOPERATIVES

IMPROVING MILK QUALITY AT THE MCC (MQ01)

Milk processors need good quality milk to comply with Food Safety standards and 'process' raw milk into other products, e.g. yoghurt, cheese and flavoured drinks.

This fact sheet has been designed support 'quality testing at MCCs and provide further information to farmers and others within the dairy industry.

Processors use several measures to assess hygienic quality of milk that has been stored in a bulk/cooling tank.

1. Cleanliness of milk - milk should not have any dirt such as flies, straw or other items in it.

If milk from the bulk/cooling tank has 'dirty items' in it, **check the following:**

- Is milk being assessed for 'cleanliness' on arrival at the MCC?
- Is only 'clean' milk (i.e. no flies, bits) being placed in the bulk tank?
- Are bulk tank lids / covers always closed and only removed when milk is being poured into tanks or cleaning and maintenance taking place?
- Are milk tanks being cleaned and drained properly?
- Is there anything above the milk tank opening that can collect dust, or cause items to fall into the milk? E.g. Lights above the tank which can collect dust or insects, or shatter and fall into the milk?

2. Added water – adding water to milk dilutes it and results in poorer quality. The presence of added water is detected at the MCC by the **lactometer** and at the processor by checking the freezing point. The normal density of milk (lactometer reading) is between 1.028 and 1.036 grams / ml and the normal freezing point is between -0.525 °C and -0.550 °C



If milk is identified as having added water, **check the following:**

At farm level:

- Are farmers freezing milk before bringing it to the MCC? (water may be separating from the rest of the milk)?
- Are farmers forgetting to dry their buckets and milk cans after cleaning?
- Are farmers deliberately adding water?

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- Does milk from some farmers repeatedly test positive for water? If so, find out more about the cows this milk is coming from and organise a farm visit to investigate further.

At the MCC:

- Are you testing for added water? – If not, then add this test to the ones being carried out when milk is brought to the MCC.
- Is your **lactometer** in good condition? i.e. not broken.
- Is your lactometer correctly calibrated? It is recommended that lactometers are replaced at least annually.
- Is the milk attendant using the lactometer correctly? Is the test being carried out correctly?
- Are milk tanks correctly drained and dried after cleaning?

AND REMEMBER:

- **Clean** the lactometer after every use, i.e. in between milk cans.
- **Store** the lactometer safely so it does not break.
- **Calibrate** the lactometer regularly – staff from the Processor will be able to help with this.
- **Replace** the lactometer annually, or if broken.
- **Ensure** the lactometer is being used properly by regularly meeting with and watching the milk attendant and organising refresher training for milk attendants at least two times per year.

3. Total plate count – this gives a measure of the **number of bacteria** in the milk.

- Information is provided as 'number of colony forming units per millilitre of milk' (cfu / ml).
- Milk with a lower total plate count is of better quality and is sold at a higher price.

- **Grade A** is 0 - 50,000 cfu / ml
- **Grade B** is 50,001 – 100,000 cfu / ml
- **Grade C** is 100,001 – 200,000 cfu / ml

At Over 200,000 cfu / ml the processor may **reject** milk

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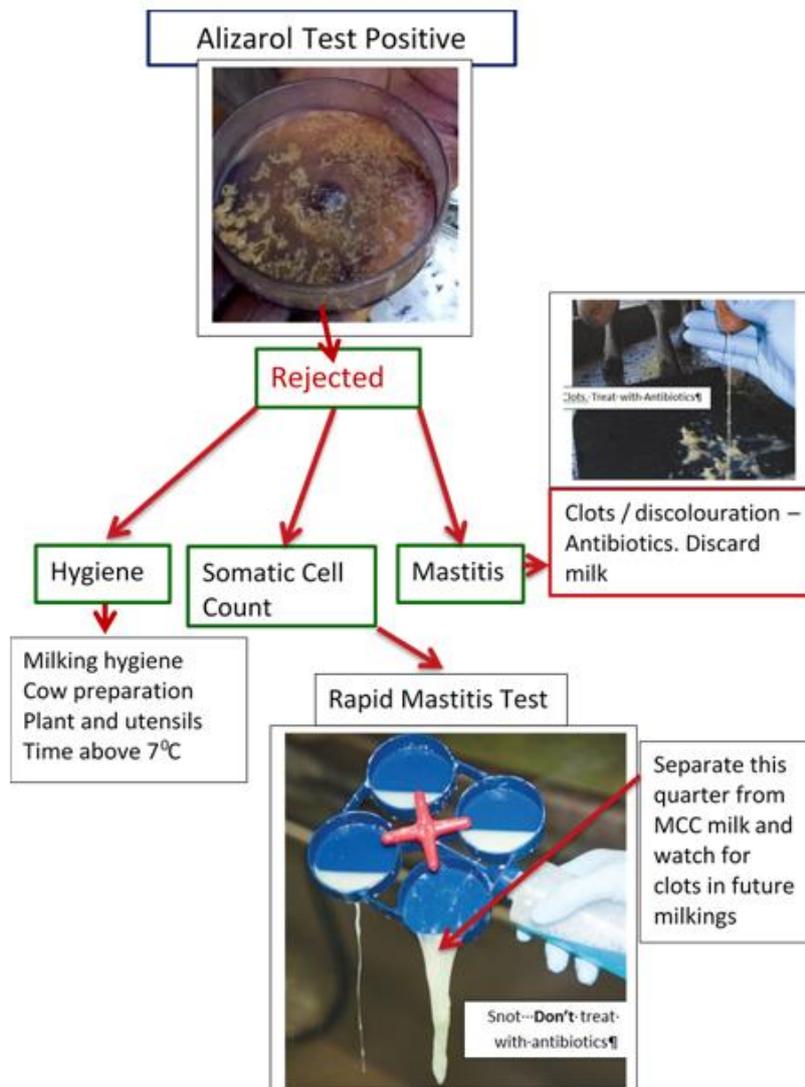
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- The **freshness (alizarol / alcohol)** test can indicate the quality of milk.
 - ✓ Milk which is not 'fresh' is more likely to have high levels of bacteria in it.
 - ✓ High levels of bacteria in the milk can make people sick and affect what can be done with the milk. Bacterial contamination can occur at a number of levels.

REMEMBER that if milk is not cooled below 5°C, the number of bacteria will continue to increase.

If milk fails the freshness test, make sure the milk attendant follows the alizarol decision tree (*below and also in SOP1 – Raw milk acceptance*)

ALIZAROL FOLLOW UP DECISION TREE



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- **Rapid Mastitis Test** using Sunlight

This test checks for cells from the cow's udder that indicate a cow has mastitis (inflamed udder).

This test should be carried out on all milk which fails the freshness test (*see alizarol decision tree on page 3 and fact sheet M03C – RMT and Subclinical mastitis*).

For additional information on mastitis and how to prevent it, see fact sheets

- *M03A - mastitis*
- *M03B – mastitis prevention and treatment*

If milk has a high Total Bacterial Count, **check the following:**

At farm level:

- How soon after milking are farmers delivering milk to the MCC? Milk should be **cooled to less than 5°C within 2 hours of milking**.
- Are farmers following hygienic milking practices? (*see fact sheets*)
- Are farmers properly **cleaning and drying buckets, cans and other milking equipment** to prevent contamination?
- Are farmers regularly checking their animals for mastitis (**visual or** using the Rapid Mastitis Test) and withholding any milk with signs of mastitis?

As a general rule, if any farmer repeatedly fails one of the tests at the MCC, arrange to visit the farm. Make a thorough "walk-through" with the farmer of all the procedures carried out for milking, handling of milk and cleaning of utensils.

At MCC level:

- Are the **cooling tanks** cooling milk at the correct temperature, even if mains electricity (ZESCO) is not available? Are tanks **regularly serviced** and **well maintained**?
- Do **milk attendants maintain good hygiene practices** when testing milk and transferring it into the bulk tanks?
- Is milk **quickly and cleanly transferred** into the bulk tank?
- Are cooling tanks **regularly cleaned** using **appropriate cleaning practices?** (*see the SOP for milk tank cleaning*)





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Transfer to the processor:

- Is milk transferred to the processor's tanker using clean equipment?
- Are tankers regularly cleaned using appropriate methods?

4. Detection of antibiotic residues

Whenever you treat an animal with an antibiotic or pesticide (medicine), the medicine is broken down into smaller pieces in the animal's body. The smaller pieces, or '**residues**' are removed from the animal's body at different times, in the dung, urine or milk.

The time it takes for the '**residue**' to no longer be present in milk is called the '**milk withdrawal period**'.

If milk is sent to the MCC during the 'milk withdrawal period' then antibiotic residues can be detected in the milk by the processor.

If **residues are detected, milk will be rejected**.

Milk with 'antibiotic or pesticide residues' in it can be difficult to process and can be dangerous to humans or animals who drink it (causing allergic reactions or contributing to resistance to antibiotics – Antimicrobial resistance). *See separate fact sheet M04 – Avoiding residues in milk for further information.*

If milk tests positive for 'antibiotic or pesticide residues', **do the following:**

- **Contact** all farmers that supplied the 'rejected' milk and find out if any of their animals have been treated with antibiotics or pesticides during the previous 14 days.
- If animals have been treated, find out when they were last treated and with what drug.
- Check that the withdrawal period has been properly adhered to.

To prevent this happening in future:

- **Raise awareness** to all farmers on the milk withdrawal periods for different drugs and the importance of adhering to it – *see fact sheets.*
- **Encourage** farmers to only buy medicines from licensed retailers and follow the milk withdrawal period.
- **Ensure milk attendants** ask all suppliers if they have recently treated their animals with any medicines / drugs. If the answer is 'Yes', find out more about the drug used and when it was used to decide whether the milk is safe to put into the bulk tank.

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To improve the quality of milk being supplied to processors, here are some things you can do:

With farmers:

- **Raise awareness** of the importance of good hygiene at milking and cleaning practices post milking. See the following *fact sheets*:
 -  M01_ZDTP practical farm advice - on farm milk quality (190822)
 -  M02_ZDTP practical farm advice - cleaning after milking (190911)
 -  M03A_ZDTP practical farm advice - mastitis (190920)
 -  M03B_ZDTP practical farm advice - mastitis prevention and treatment (190922)
 -  M03C_ZDTP practical farm advice - RMT and subclinical mastitis (190918)
- **Encourage** farmers to bring milk to the MCC as soon as possible after milking. Milk needs to be cooled within 2 hours of milking.
- If farmers are storing night milk, they should cool in a fridge / freezer and NOT mix with morning milk.

If a farmer repeatedly fails one of the tests at the MCC, arrange to visit the farm. Make a thorough "walk-through" with the farmer of all the procedures carried out for milking, handling of milk and cleaning utensils.

At the MCC

- Ensure equipment, water and chemicals for 'reception tests' are always available (lactometer, alizarol / alcohol, clean dishes, Sunlight dishwashing liquid).
- Ensure milk attendants are trained to carry out the tests, carry them out correctly by following **SOPs** and receive regular 'follow up' training.
- Ensure farmers receive a '**rejection slip**' which clearly identifies why milk was rejected



REF-NO:¶

Date: _____ → Farmer-name: _____ ¶

Primary-Cooperative: _____ → Phone-number: _____ ¶

_____ litres-of-milk-were-rejected-due-to-the-following-reasons:¶

- Contamination-with-foreign-matter-(flies,-straw,-hair,-etc)¶
- Failing-freshness-test¶
- Addition-of-water¶
- Mastitis¶
- Other-_____¶

For-follow-up-support,-please-contact-your-local-extension-officer¶

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- Encourage farmers whose milk has been rejected to have a visit from a local extension officer within 24 hours of milk being rejected.
- Have a **supplier agreement** between the cooperative and farmer to clearly 'set out' roles, responsibilities and expectations. *See next page for a sample agreement.*
- Ensure milk attendants follow **SOPs** when cleaning bulk tanks and other equipment at the MCC.
- Use **incentives to encourage** farmers to supply good quality milk, e.g. reward farmers who supply milk which is not rejected.
- Use **penalties to discourage** farmers from supplying poor quality milk, e.g. if a farmer supplies milk containing antibiotic residues which contaminates 'bulked milk' ask the farmer to reimburse the cooperative for some of the financial loss suffered.
- **Stock** milk quality related products at the MCC and sell to farmers to ensure they have access to these products, e.g. teat dip, teat salve and Sunlight.



Draft SOPs are provided as attachments.

REMEMBER:

- Milk is a fragile food product which can easily spoil.
- Ensuring quality milk is supplied to processors starts from the farmer and ends at the MCC.
- Everyone benefits (farmer, cooperative, processor, consumer) when good quality milk is supplied to the MCC.



The ZDTP is focused on supporting dairy farmers to improve their productivity, milk quality and linkages to urban markets. The views expressed in this publication are those of the implementers of the programme and do not necessarily reflect those of the New Zealand Government. For further information, please contact ZDTP Country Manager Tania Thomson on tania@primeconsultants.net or +260 96 456 4206



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DRAFT SUPPLIER AGREEMENT BETWEEN COOPERATIVE AND FARMER

As a supplier of raw milk to **NAME OF COOPERATIVE**, I agree to:

1. Have my animals tested annually for brucellosis and tuberculosis and provide certificates to the MCC;
2. Only provide milk in its raw form to the MCC;
3. Not add water, or any other substance to my milk;
4. Not provide milk from the first eight milkings of my animal after calving, i.e. **no colostrum**;
5. Not supply any milk from cows being treated with antibiotics;
6. Declare to the milk attendants if any animals supplying milk have been treated with antibiotics, or any other medication during the previous 7 days. Information on the type of antibiotic / medication used, method of treatment (e.g. injection, intra mammary tube) and dates of use should be supplied so a decision can be made on whether the milk is suitable to be accepted by the MCC;
7. Not knowingly supply milk from an animal with mastitis, or which is sick;
8. Only provide milk to the MCC in stainless steel / aluminium milk cans which are in good condition;
9. Ensure good hygiene on my farm;
10. Clean and dry all equipment (buckets, cans and utensils) used to store / transport milk;
11. Ensure any person suffering from a notifiable disease or any other food safety-related illness (*E.g. person with high temperature, vomiting, diarrhoea*) has no contact with raw milk or cows supplying milk;
12. Take any rejected milk away with me and safely dispose of it, ensuring it is not mixed with other milk which is then re-submitted to the MCC;
13. Be courteous in all my dealings with staff and other suppliers at the MCC.

Signed by:

Name: _____ **Date:** _____

Signature: _____

NAME OF COOPERATIVE agree to:

- Test milk in line with good practice (see SOPs at the MCC);
- Display the milk price at the MCC;
- Pay farmers for all milk accepted at the MCC, irrespective of whether or not it is accepted by **NAME OF COOPERATIVE**;
- Provide farmers with a reason why milk is rejected and access to an advisor to undertake a follow up visit at the supplier's farm to, as necessary, carry out an investigation or provide advice;
- To store and assist in collection of milk by **NAME OF COOPERATIVE** in such a way as to not affect the quality of the milk supplied;
- To engage with **NAME OF COOPERATIVE**, and where necessary follow up on any disputes in order to ensure milk is accepted and paid for and farmers receive a fair price;
- To provide suppliers with information on milk quality which is supplied by **NAME OF COOPERATIVE**.
- Be courteous in all dealings with suppliers to the MCC;
- Do its utmost to comply with the laws of Zambia.

Signed by:

Name: _____ **Position:** _____

Signature: _____ **Date:** _____