MANUAL

QUALITY-BASED MILK PAYMENT SYSTEM PILOT PROJECT

Operating Procedures and Work Instructions

Version 2
October 2018

Happy Cow Ltd.
P.O. Box 558
Nakuru-20100
Kenya

Netherlands Development Organisation

Ngong Lane, off Ngong Road
P. O. Box 30776 -00100
Nairobi, Kenya

Contents

1. Introduction

This Manual contains technical guidelines for the implementation of a Quality-Based Milk Payment System (QBMPS), a pilot project started in November 2015. The QBMPS is implemented as a "proof of concept" by Happy Cow Ltd in Nakuru and two of its suppliers: New Ngorika Milk Producers Ltd. and Olenguruone Dairy Cooperative Society. The pilot project is co-financed by the Kenya Market-led Dairy Programme (KMDP) of SNV-Netherlands Development Organisation that is in turn funded by the Embassy of the Kingdom of the Netherlands in Nairobi.

The Manual describes the operating procedures and work instructions for applying the QBMPS, as designed and implemented by Happy Cow and its business partners, the two dairy enterprises that supply milk to the processing company (referred to in this manual as Cooling and Bulking Enterprises, or CBEs).

The procedures and work instructions described in the Manual are applicable to the Processor as well as the two CBEs responsible for implementing the milk payment system. Together, these partners make up the QBMPS "Organisation" that is referred to throughout the Manual. The QBMPS Organisation consists of employees from each of the partners, most of who have to adapt their existing functions, while also reporting to the QBMPS Project Manager. Because the QBMPS is managed and operated by different personnel with diverse functions within the participating organisations it is most important that all employees concerned are well versed on their tasks and responsibilities and understand what the chain of command is, as well as what information they have to report, when, and to whom.

The first two chapters of this Manual provide an overview of the Quality-Based Milk Payment System and the key elements in the QBMPS structure, as designed for Happy Cow Ltd.

Chapter 3 provides a detailed description of four key procedures in the QBMPS, namely: (i) identifying and registering farmers and farmer groups; (ii) organising the milk collection, transportation and cooling system; (iii) controlling the quality of milk collected; and (iv) paying a bonus to farmers and farmer groups whose milk meets the agreed quality standards.

The three annexes to the Manual (A, B and C) provide the job descriptions of all functions involved in the QBMPS, as well as the corresponding work instructions identified in the various procedures, including the reporting formats.

Annex A provides descriptions of 12 job functions within the QBMPS. It outlines the specific procedures, location of operations, reporting requirements and work instructions associated with each function.

The Work Instructions (WIs) are shown in Annex B. Each Work Instruction contains a detailed description of the tasks that need to be accomplished at that particular point of the QBMPS process and identifies the relevant job functions required to accomplish each task. However, this does not mean that a WI corresponds to only one job function. It is therefore important for the different functions within the QBMPS to have access to all WIs that describe for which they are responsible. For this reason, the WIs should be made available to different functions in the Organisation, which also makes them very relevant for training purposes.

In addition to the Work Instructions, the Manual contains a set of directives, elaborated in Annex C. These are guidelines that are applicable to the overall organisation and/or rules and regulations issued by management or company boards of directors. Because these directives are issued at different moments in time it is important that the date of issue is shown and that each directive is updated as soon as a new directive has been issued.

The Manual is a “living document” that will be amended from time to time, if and as required, to keep up with lessons learned, new insights on quality-based payments, technical and process improvements, as well as management, market and strategic changes. The Manual will require frequent updating and all changes need to be communicated promptly and adequately to all persons and functions involved in the processes.

It must be noted that this Manual reflects the initial project design as laid down in the project proposal submitted by Happy Cow to SNV for Phase 1 and Phase 2. It brings together in one document the procedures, functions and Work Instructions that were developed during the course of project implementation for this particular project or proof of concept.

This Manual is therefore not meant as a blue print or “best practice” of implementing QBMPS in Kenya or East Africa. It simply operationalises the work processes, functions and procedures as per the project design for this particular project and the milk quality parameters identified for tracking and tracing and bonus payments.

However it is hoped that the Manual will contribute to sector learning on the technicalities of implementing the Happy Cow QBMPS and good practice in the milk collection chain and milk handing, storage and testing. The pilot project is currently being documented by 3R Kenya Project (WUR, ACTS, EGU) for sector learning and to arrive at recommendations on the feasibility of replication and scaling-up. This will include suggestions on what is needed to create a (more) conducive enabling environment for introducing and upscaling a QBMPS in the Kenyan smallholder supply chain.

For background information and sharing of initial lessons learned, Happy Cow Ltd has included a section at the start of this Manual in form of a power point presentation. The information in this power point presentation reflects the views of Happy Cow Ltd, and not necessarily those of the project partners New Ngorika and Olenguruone CBEs, the fund manager SNV and the donor (the Netherlands Embassy in Nairobi).

Taste Happiness!

Happy Cow Dairy

Implementing a Quality-Based Milk Payment System (QBMPS) in Kenya

Prepared by
Gerard Oosterwijk
Happy Cow Ltd.

Project period
January 2015 to
August 2018

Start: The QBMPS project

Partners in the project

- Happy Cow Ltd – HC (Dairy processor at Nakuru)
- Two cooperatives (Ngorika and Olenguruone), these coops are also referred to as a Cooling and Bulking Enterprises (CBEs)
- The Kenya Market-led Dairy Programme (KMDP) managed by SNV with funding from the Embassy of the Kingdom of the Netherlands

Start of the Project

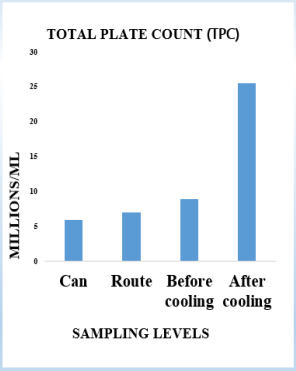
- Historical data shows major challenges in Total Plate Count (TPC), adulteration & antibiotic residues in milk; far above Kenya Bureau of Standards (KEBS) limits
- Happy Cow submitted a project proposal to SNV-KMDP to pilot a Quality-Based Milk Payment System (QBMPS)
- A track and trace (T&T) system is required as a pre-condition for the QBMPS
- A zero-setting baseline study is conducted in mid-2015

Start: Some historical HC data on raw milk

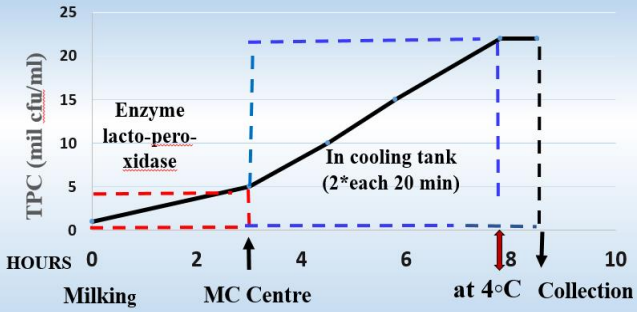
	DATE	CBE	TPC/ML	Resazurin	Antibiotic
	KEBS	2007	< 2,000,000	4-6	< 4 PPB
1	7/6/05	BULK SILO	98,000,000	4	
2	26/9/11	BULK SILO	160,000,000	4	
3	1/11/14	Coop B	190,000,000	5	POSITIVE
4	19/11/14	Coop A	110,000,000	5	POSITIVE
5	28/01/15	Coop A	160,000,000	4	
6	30/04/15	Coop A	100,000,000	4	

Zero Setting: Results mid-2015

- Very high bacterial load (TPC)
- High rates of antibiotic residues
- Incidences of mastitis (CMT)
- Adulteration cases (water and preservatives)
- Lack of correlation between Resazurin test and TPC
- Inefficiency of installed milk coolers (**can act as incubators**)



Zero Setting: Breakdown of the cold chain



Interventions to arrest microbial multiplication:

- Enhance hygiene practices
- Fast delivery & cooling (PHE + Chiller) or Thermization

Kenya: Challenges in raw milk collection

- 1.5 million small scale farmers, each marketing < 8.0 ltr/day
- Milk collection points (MCPs) with poor network and no reliable water source
- Cold chain rules not observed causing high bacteria count
- Unethical practices in the raw milk value chain
- Dairy processors & cooperatives not proactive to improve quality
- Thriving informal milk marketing with no checks
- Market is volume-based with low awareness on quality
- Kenya Dairy Board (KDB) constrained in applying standards

Kenya: Disputable practices in milk collection

- Use of dirty plastic jerry cans and sometimes preservatives
- Milk collection as late as 11.30 am and inefficient milk coolers
- Coops/processors accept rejected raw milk from elsewhere

Kenya: Milk quality and health/safety concerns

- Preservatives like hydrogen peroxide (H_2O_2) mask bad hygienic practices
- Free radicals released by H_2O_2 can have health effects e.g. DNA mutation, cancer etc
- Antibiotic residues contribute to allergic reactions and to resistant pathogens (EU & USA zero tolerance AB in milk)
- AB residues severely restrict production of yoghurt and cheese
- Adulterants: water to increase volume and starch & sugar to compensate for density, all of which act as contamination sources
- High bacterial counts produce heat resistant enzymes which can be passed to the final dairy products

Project: Track & Trace system for milk quality

The objective of a Track & Trace (T&T) system is to enable:

- Identification of raw milk quality at critical points in the collection chain
- Identification of farmers, milk cans (aggregated milk), milk collection points and routes
- Identification of causes of quality losses
- Taking of appropriate corrective actions to improve quality

A T&T system enables the monitoring of milk quality in a milk can, MCP or route to a certain group of suppliers, allowing for quality payments of milk to farmers.

Project: T&T, IT programme and payments

Olenguruone Dairy Farmers Co-Op Society LABORATORY reference to the sampling Plan and Procedures

LABORATORY REPORT
Serial Number: GTLJ - 287
Date Generated: 03-Sep-2017

QBMPS Report from 01-Aug-2017 to 31-Aug-2017

No	Sample	TPC_Count_(cfu/ml)	Total_Solids (InfraRed)	Freezing_Point_Depression (InfraRed)	Z_Value (DELVO SPNT)	Lactoscope_Comments	Bacterial_Comments	Delvo_Comments
5.	021OLE	2,375,000	12.28	512.60	-12.68	Above Limit	GRADE B	Negative
6.	022OLE	4,850,000	12.19	514.75	-12.68	Above Limit	GRADE B	Negative
7.	023OLE	10,900,000	12.07	510.90	-12.53	Above Limit	GRADE C	Negative
12.	043OLE	1,625,000	12.50	515.25	-14.46	Above Limit	GRADE A	Negative

A computer programme was developed to link:
1) Individual farmers to a certain milk can or MCP
2) Random testing of cans on quality parameters (at HC lab)
3) Payment to farmers include quality results (feedback to coop)

Project: HC payment module consolidated

Test	TPC Grade A	TPC grade B	TPC grade C	Antibiotics	Adulteration	Total solids
% score	+50	0	-50	+15	+20	+15

GRADE	% PAYMENT RANGES	PAYMENT	AMOUNT (KSH)
A	70-100	Premium	+2
B	40-69	Standards	+1
C	<40	Penalty	0

It is difficult to have a price neutral payment system in Kenya (where penalties raised are used to pay for QBMPS bonuses) since farmers simply switch to another buyer.

Project: Laboratories

Cooperative lab - Acceptance tests

HC laboratory - QBMPS tests

- Milk needs to pass all acceptance tests before bulking
- Random can samples are taken for QBMPS tests at the HC lab

Project: Milk collection points (MCPs)

MCPs are necessary for fast grading and collection of raw milk by combining the use of farmer graders and peer pressure

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Project: Only proper milk cans, no jerry cans

A stubborn practice that is difficult to change

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Project: Use of clean water, e.g. for can washing

But…rural conditions present challenges…

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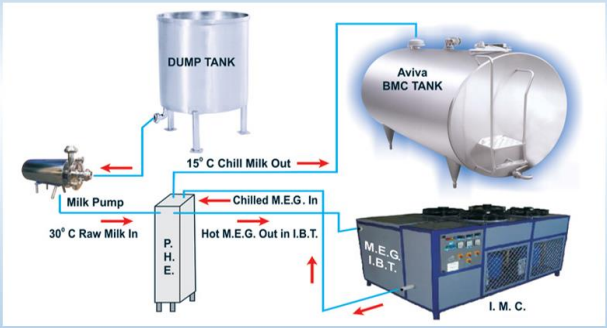
Project: Instant chilling combined with cooler



Economical option: use of same compressor(s)

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Project: Training farmers, graders & handlers

Project: Sampling regime in a QBMPS

1. Milk qualifying for QBMPS needs to first pass all acceptance tests
2. Accepted raw milk is bulked in a cooling tank and can samples are taken for analysis to the HC Lab to define QBMPS payment mode
   - Cans are tested twice/month
   - Analysis results are shared at the end of a month with the Coop

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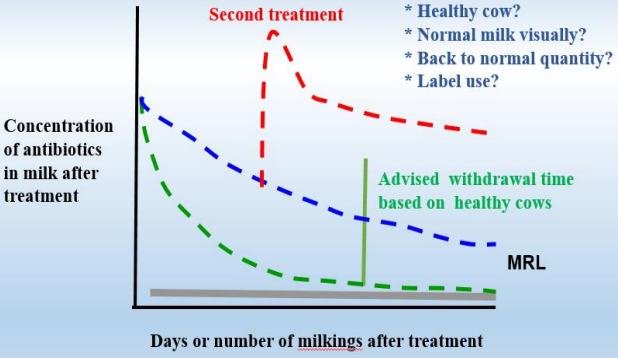
Project: QBMPS Parameters at HC lab

1. Total bacterial count or TPC
2. Presence of antibiotic residues
3. Adulteration
4. Total solids (incl. fat, protein, lactose and ash)
5. Somatic cell count (start 2018)
6. Aflatoxin M1 (start 2018)

Cans that pass these parameters receive a bonus

General: Antibiotics and withdrawal period: even when adhered to, often not enough



General: Aflatoxin (M1) & Somatic Cell Count SCC)

M1 MRL (bulk milk):
- EU = 0.050 ppb
- Codex/USA/KE: 0.5 ppb
- HC so-far: < 0.4 ppb

SCC Max (per can):
- KE/EAS: 300,000 per ml
- EU: 400,000 per ml
- USA: 750,000 per ml (changed?)
- HC so-far: 90,000 - 270,000 per ml

BIO-Easy (CH)

Project: Main achievements

1) Pilot project has put QBMP high on the agenda. Awareness took place at all levels with many presentations of the HC experience.
2) Many forums agreed that Kenya cannot afford to continue paying only for milk volumes due to a range of reasons.
3) Achievement in 4 main parameters:
   - Antibiotic residues: under daily surveillance
   - Total Solids: now often within standards
   - Adulteration: now often within standards
   - TPC: remains main challenge and still much above standards
4) KENAS-ISO accreditation of HC dairy laboratory in progress.

General: QBMPS financial and health benefits for private and public good

General:
- Export/trade market expanded
- Prolonged product shelf life
- Improved product quality
- Guaranteed food safety for better health

Processors: Reduced processing costs and losses (<market returns)

Farmers:
- Improved income through bonus and reduced losses (<rejection)
- Payment based on composition (fat & protein) thus encouraging proper breeding with higher TS per liter

3R Wageningen University Study (April '18)

Private and public costs & benefits of a QBMPS (HC project)

1. Bonus payment of KES 2.00/kg milk for Grade A milk.
2. Net loss of KES 2.50 KES/kg milk for Processors & CBE/Coop for milk handling, lab costs, bonus payment, extra staff and training. To be met by an efficient value chain or higher consumers prices.
3. Health benefits KES 10.00/kg from avoided costs of milk-related illness (e.g. leading to average loss of 855 deaths per year).
4. Trade benefits can be included in benefit of KES 10.00 kg milk.
5. Lack of enforcement at many levels requires that consumers and import/export markets will become watchdogs.

Conclusion: The huge public health and trade benefits justify private, public & donor investments to support setting-up a QBMPS.

Project: Lessons learned

- Commitment of CBEs) or cooperatives is key to success. Premium payment is a big driving factor for success of a QBMPS.
- Infrastructure and milk quality polices at CBEs are currently inadequate. This contributes to high bacteria load, adulteration and other unsafe practices.
- Competition among informal sector & processors limits success of implementation (e.g. rejected milk is taken to competitors).
- Processors do not have a common strategy on milk quality in a market that is driven by volumes instead of quality.
- For effective cooling, use of plate heat exchanger is desirable.
- Implementing a QBMPS requires several years (behaviour change).
- Essential is to bring down TPC, but process is very slow.

Project: Good Practices for scaling-up a QBMPS

- Availability of clean water and electricity at MCPs is obligatory
- Only aluminum cans (no plastic jerry-cans) should be used
- Time phased collection; earliest at 07.00hr and latest 10.00hr
- Such timely collection assist fast cooling (not all milk at same time)
- Fast cooling should be completed by 11.00 am
- Evening milk not be mixed with morning milk (ideal scenario)
- A cooperative needs good relations with farmers, MCPs and transporters who are jointly responsible for a successful QBMPS
- Sizable and effective sampling unit for T&T: >150 - 300 ltr.
- Support from KDB and County reps are essential in enforcing dairy regulations (e.g. only licensed hawkers procuring from coops)

Matters that did not work properly

Project Design

- Can ownership: compromised during transport, reducing chances for farmers to access a bonus
- T&T and 4 QBMPS parameters: tedious, expensive and not sustainable
- Project ownership: Focused on HC and not fully owned by CBEs
- Bonus payments: Mainly for farmers and no incentive for transporters or CBE management
- Difficult interventions: commitment letters, use of MCPs, timely delivery and separation of morning/evening milk

"Un-level Playing Field"

- KDB presence still not being felt in enforcing dairy regulations
- Processors still not proactive about quality and accept any milk

Matters that worked well

QBMP awareness creation (public)

- 30 presentations by HC over last 3 years
- QBMPS is now included in Strategic Plans of KDB & KDPA
- Publication of studies, e.g. 3R Wageningen "Private and public costs and benefits of implementing a QBMPS in Kenya"

Project implementation (CBE)

- Removal of plastic jerry-cans especially during transportation
- Reduced H2O adulteration & enhanced testing of antibiotic residues
- Major investment done by CBEs to ensure quality (fast cooling)
- Milk quality polices included in CBE bylaws

Matters for scaling-up QBMPS

Administrative

- To work more with local KDB and Counties
- Ensure greater ownership & implementation by CBE

QBMP implementation

- T&T from 50 litre milk can towards MCPs (> 3 cans)
- **Ksh 1/- bonus** for CBE implementing step-by-step good practices
- **Ksh 2/- bonus** for outstanding MCPs based on regular testing for TBC at HC lab
- Daily use of milk analysers at MCP for bonus (composition) and rejection (added water/salts)
- Other HC lab tests and trend reports include: AB scanning, Lacto-Scope (infra-red), Gerber fat, SCC counter, Aflatoxin M1, etc.

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Happy Cow Dairy

SNV Connecting People's Capacities

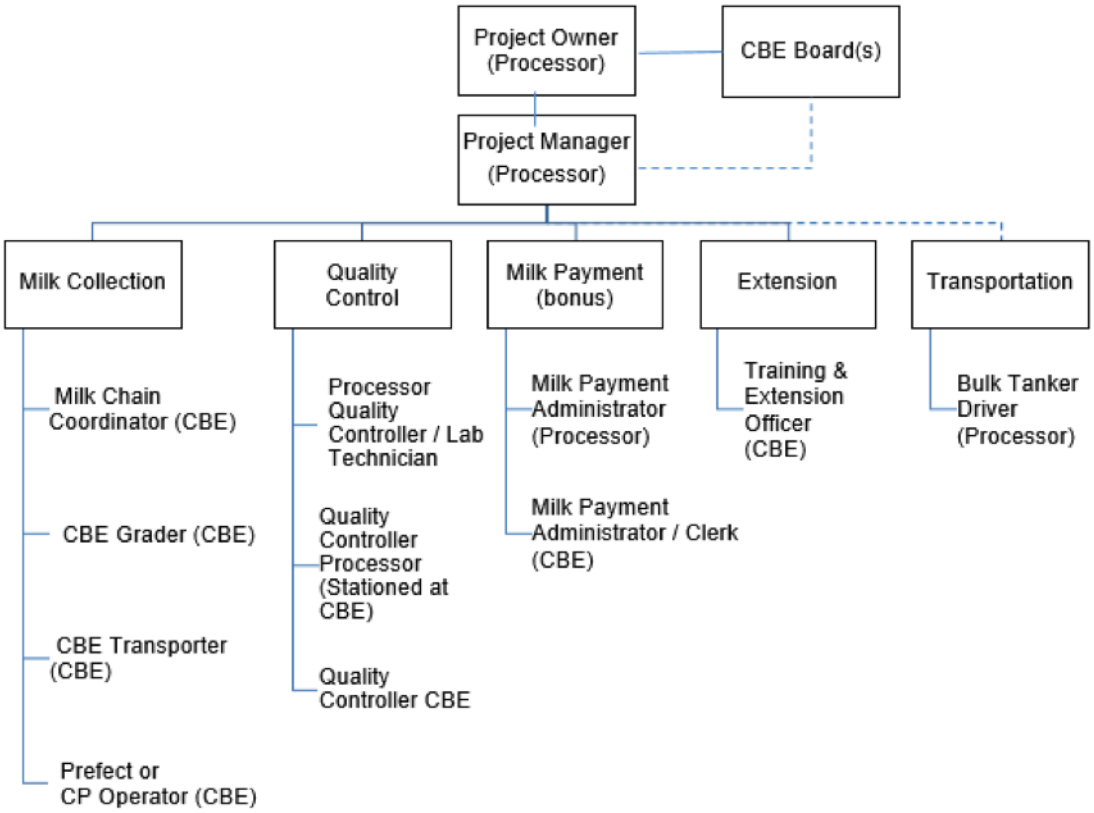
Food safety has no boundaries!!!

Thanks for reading

2. QBMPS Management Organisation

A total of 12 job functions have been identified for the QBMPS, at the Processor and CBE level. As depicted in the organisational chart below, the key management function is the QBMPS Project Manager (PM). It must be noted, however, that while the chart shows functions that are under the direct supervision of the Project Manager, it does not necessarily mean that the entire section or department lies under the sole responsibility of the PM. The functional staff working in these sections or departments may have their own supervisor/manager who is not necessarily a subordinate to the PM. However, the relevant functions within the organisation section or department do have an obligation to report to the PM. For example, a driver working for the processor's bulk tanker reports to the company's Production Manager, as well as the PM, concerning milk volumes transported, travel times and so on.

Figure 1. **QBMPS organisational chart**



Job functions

No.	Name	Annex	Remarks
Processor			
1	Project Manager	JD-001	
2	Processor Quality Controller/Lab technician	JD-002	
3	Bulk Tanker Driver	JD-003	Report to Prod. Mng
4	Milk Payment Administrator	JD-004	Finance dept. processor
5	Processor Quality Controller (CBE)	JD-005	Stationed at CBE (platform)
Collection Bulking Enterprise (CBE)			
6	Milk Chain Coordinator	JD-006	
7	CBE Grader	JD-007	Grades farmer's milk
8	CBE Quality Controller	JD-008	Grades milk at CBE Platform
9	CBE Transporter	JD-009	Between CP and CBE
10	Milk Payment Administrator / Clerk	JD-010	Finance dept. CBE
11	Training & Extension Officer	JD-011	
12	Prefect / Collection Point Operator	JD-012	

Annex to Manual

3. Description of the main QBMPS procedures

3.1 IDENTIFICATION & REGISTRATION SUPPLIERS AND FARMER GROUPS

(Milk can ownership)

3.1.1 Purpose

The procedure for the identification and registration (I&R) of dairy farmers and farmer groups must ensure a unique identification of all suppliers and farmer groups. This is to enable effective monitoring of all milk deliveries by individual as well as group suppliers from the point of delivery right up to quality analysis and payment. In this process, the Milk Chain Coordinator (MCC) is an important link of communication between CBE operations, transporters and farmers. It is the MCC who manages the farm groups, for example identifying farmers to be grouped under a single milk can.

3.1.2 Scope of operations

This procedure describes the identification of farmers from the moment they apply for membership of the CBE, as well as the identification and organisation of farmer groups. It also describes the reporting processes between the CBE and the Processor.

3.1.3 References

In developing the milk payment procedure, the following documents have been used as references:

- Minutes of project meetings with CBEs, dated 04 July 2016
- Happy Cow Company Directives DR-001

3.1.4 Definitions

The following abbreviations have been used in the farmer identification and registration process, as well as the milk can ownership Standard Operating Procedure:

CBE	Cooling and Bulking Enterprise
MCC	Milk Chain Coordinator
MQT&T	Milk Quality Tracking & Tracing
QBMPS	Quality-Based Milk Payment System
QC	Quality Controller
RP	Record and Report
WI	Work Instruction

3.1.5 Description of the procedure

a. <u>Farmer registration by CBE</u>

Farmer identification and registration starts when a farmer expresses the desire to join the CBE or MQT&T/QBMPS programme. The Accounts Clerk embarks on registration of the farmer by asking him/her to fill out a CBE member application form.

b. Farm verification by CBE

The Accounts Clerk informs the responsible route director about the about the potential member. The route director is required to visit the farmer and ascertain that there are dairy cows on the farm to avoid registering “ghost” farmers. Upon visiting the farm, the director calls the CBE office to confirm whether the information provided by the farmer is correct.

c. Individual membership registration by CBE

Once the information supplied by the applying farmer is confirmed, the registration is finalised and the farmer is issued with a member number, as set out in *WI Identification of Suppliers & Farm Groups* (WI-001)**.** The Accounts Clerk then produces the *Issue Supplier Number Report* (RP-001) and *Suppliers List and Volumes Delivered Report* (RP-002).

d. Farmer group registration

The MCC receives two reports from the Accounts Clerk: *Issue Supplier Number Report* (RP-001) and *Suppliers List and Volumes Delivered Report* (RP-002). The two forms are used to allocate the farm group or project milk can number to the newly registered farmer. The MCC allocates the milk can as set out in the *MCC operations work instruction* (WI-001). The MCC then produces the *Register Group & Milk Can Number Report* (RP-003).

e. I&R reporting by the CBE to the Transporter

The Grader Farmer/Transporter also receives the Issue *Supplier Number* (RP-001) and *Suppliers List and Volumes Delivered* (RP-002) for use during milk grading and collection at the collection points. The Grader is a critical link in the QBMPS since he/she is responsible for bulking delivered milk in the allocated project milk cans.

f. Reporting I&R by the CBE to the Processor

Each month, the MCC hands over a *Register Number of Project Milk Cans/Farm Groups Report* (RP-004) to the Project Manager (Processor). The Project Manager then shares the register with the Processor’s Quality Controller (QC) who uses it when generating the monthly sampling schedule.

3.1.6 **Work Instructions** (Flow Chart 1)

Identification & Registration

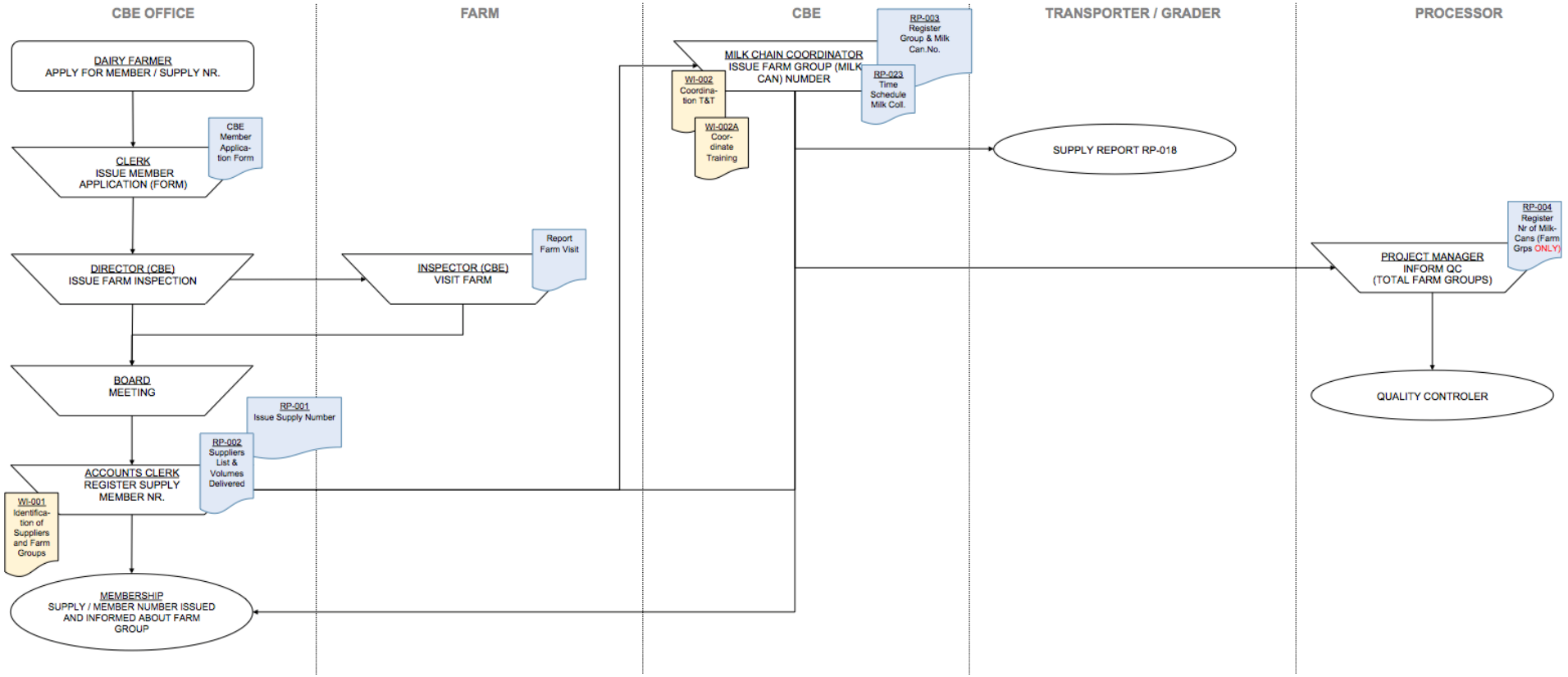
RP No.	Name WI	Job function
WI-001	Identification of Suppliers & Farm Groups	Accounts clerk
WI-002	Coordinating Tracking & Tracing	MCC
WI-002A	Coordinating Training	MCC

3.1.7 **Records and Reports**

Identification & Registration

RP. No.	Name Report	Function
RP-001	Issue Supply Number	Accounts Clerk (CBE)
RP-002	Suppliers List & Volumes Delivered	Accounts Clerk (CBE)
RP-003	Register Group & Milk Can numbers	MCC
RP-004	Register Number of Milk Cans	Project Manager (Processor)
RP-023	Time Schedule Milk Collection	MCC

3.1.8 Flow Chart 1: *I&R of suppliers and farmer groups*



3.2 MILK COLLECTION

3.2.1 Purpose

This procedure provides guidelines for the collection and handling of farmers' milk in accordance with agreed project standards. The aim is to ensure that the collected milk is of "Project Milk" standard, which means that the milk has been collected and delivered under conditions that will qualify for bonus payment under the QBMPS programme.

3.2.2 Scope of operations

This procedure describes the chain of milk collection activities that include the milk reception from farmers (at milk collection points), milk reception at the CBEs, and delivery and reception at the milk reception platform of the Processor (Happy Cow).

3.2.3 References

In developing the milk collection procedure several documents were used as references:

- CBE and Processor Commitment letter 26 June 2017
- CBE Directive, DR-001
- Milk Bonus Payment Pricing Directive, DR-002

3.2.4 Definitions

The following abbreviations are utilised under this procedure:

CBE	Cooling and Bulking Enterprise
CP	Milk Collection Point
MQT&T	Milk Quality Tracking & Tracing
QBMPS	Quality-Based Milk Payment System
QC	Quality Controller
RP	Record and Report
WI	Work Instructions

3.2.5 Description of the procedure

a. <u>Milk reception & grading at a Milk Collection Point</u>

A prerequisite of the QBMPS – in situations where milk is collected from many smallholder farms – is for farmers to be organised in groups. Accordingly, the daily milk deliveries for all members in a farmer group are mixed into one milk can, each of which has a unique identification number. This enables the QBMPS implementing organisations (Happy Cow and the two CBEs) to determine the quality of milk delivered by the entire group and apply a corresponding (calculated) bonus payment in addition to the milk price. The pricing conditions of the bonus payment are stipulated in the *Milk Bonus Payment Pricing Directive* (DR-002), which describes the different milk quality parameters, standards and criteria that need to be met to fulfil the bonus payment conditions.

There are several options for organising the grouped collection of farmers' milk deliveries under a QBMPS. The preferred collection method for farmers is

that a CBE grader joins the milk collection transporter and checks the quality of milk delivered at farm gate. However, this method presents a drawback as it means that the transporter has to stop at every farm. A more efficient alternative from the perspective of the QBMPS is for farmers to take responsibility for the first step in the milk collection chain, by bringing their produce to a dedicated milk collection point (CP). With an average of 10 farmers bringing their milk to one CP, this means that the number of stops on a milk collection route that consists of 100 farms will be reduced from 100 to just 10 stops. This not only results in faster milk collection but also builds a sense of shared responsibility among the farmers about the need to maintain milk quality.

Another condition for each of the farmers participating in the QBMPS is that they should deliver their milk to the CP in an aluminium container. The use of ordinary plastic containers for milk transportation is prohibited due to hygiene considerations. Among other concerns, such containers may not be of food grade quality and are difficult to clean properly due to the small openings at the top of most containers.

At the CP, the milk is presented by the farmer to a Prefect (or CP Operator). The role of the Prefect is to coordinate certain collection activities, such as establishing milk can ownership to ensure traceability under MQT&T conditions, and maintaining hygiene at the collection point. These activities and responsibilities are set out in the *WI Farm Milk Collection* (WI-003). Accurate registration of group (milk can) ownership among farmers is a critical step in allocating bonus payments for quality milk.

In some areas, the prefect's role is taken on by "Grader Farmers" contracted by the CBE.[1] A Grader Farmer monitors milk delivered by individual farmers using the acceptance tests for milk. If the milk does not meet the required criteria, the Grader Farmer rejects it and the farmer's delivery is not accepted. The Grader Farmer then weighs, records and bulks the accepted milk in dedicated 50-litre aluminium milk cans as set out in the *WI Farm Milk Grading* (WI-004)**.**

[1] *Note: Special notice must be given to the situation of milk grading as it is done at the collection points at the CBE of Olenguruone where the farmers are organising the transportation and grading themselves. The responsibility for grading and transporting milk is assigned to a single person (Motorbike Transporter) who has been contracted by the farmers. Although this person does grade the milk, the CBE does not consider this as transfer of ownership. This only happens when the milk has been delivered at the CBE Platform and accepted by the Grader (CBE Platform). As per instruction of the farmers the Motorbike Transporter does take a record of the farmers' individual deliveries and hands these over the Grader (CBE Platform) who then issues an Individual Farm Receipt through the CBE milk reception. This receipt is handed to the individual farmers on the following day. Flow Chart 2 illustrates the difference between the two systems.*

The Grader (CBE) produces two reports, *Farmer Delivery Receipt* (RP-005A) and *Daily Delivery Receipt or Journal* (RP-005B) for each milk grading session.

b. Transportation of milk from the CPs to the CBE

The CBE is responsible for organising milk collection routes and allocating a certain number of CPs to a single route. This information is available in the directive DR-001 issued by the CBE and is circulated to all persons involved in milk collection, grading and transport.

The Transporter brings milk that has been accepted at the CPs (and grouped in milk cans) to the CBE platform as set out in the *WI Farm Milk Transport* (WI-005)**.** The Transporter is responsible for handing over the *Daily Farm Monthly Delivery Journal* (RP-005B) for each route upon delivery at the CBE Platform.

In order to monitor the transport duration and delivery times of each milk collection route, the Transporter is obliged to record the arrival time at the CBE. This is done by means of a clocking system and reporting is monitored through the *CBE Route Transport Time Record* (RP-005C).[2]

c. Milk acceptance at the CBE Platform

Upon arrival of the Transporter, the Grader Farmer (CBE) presents the milk cans to the Quality Controller (Processor) for grading. He/she also hands over the daily report Daily *Farmer Delivery Monthly Journal* (RP-005A) to the QC (CBE Platform). The Work Instructions that are applicable for the different functions that operate at the CBE platform are shown in WI *Milk Reception CBE Platform* (WI-006).

The Quality Controller (CBE), who acts in the interest of the Processor, records the volumes that are rejected at the CBE Platform and makes a daily *Milk Rejects CBE Platform Report* (RP-006). Milk that is rejected is considered as "Non Project Milk" and is handed over to the QC (CBE) in separate milk cans. It is important that this milk is not mixed with accepted milk!

Once the QC (CBE) has accepted the milk, he/she hands it over to the Grader (CBE) who records the accepted volumes and records the weights. Furthermore, the Grader (CBE) is responsible for bulking and cooling the accepted milk. The Grader (CBE) handles the milk as set out in the *WI Milk Reception CBE Platform* (WI-007) and generates the *Milk Receipt CBE Platform* (RP-007).

An important aspect of the milk acceptance procedure at the CBE is to separate milk that meets QBMPS conditions from lower quality milk. In order to do this, it is essential that the two qualities are bulked and stored separately (in different bulk cooling tanks at the CBE).[3]

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[2] *Still under development at the time of publishing the first edition of this Manual*

[3] *Same note 2.*

The QC (CBE) is responsible for milk that is dispatched from the CBE to the Processor. The dispatched milk is handed over to the Bulk Tanker Driver who is responsible for transporting the cooled milk to the Processor. The procedure of dispatch is shown in the *WI CBE Milk Dispatch +CIP* (WI-008)**.** The QC (CBE) also generates the *CBE Daily Milk Dispatch Note* (RP-008) and hands them over to the CBE as well as the Processor.

d. Bulk milk transportation from the CBE to the Processor

The Bulk Tanker Driver transports the cooled milk from the CBE milk cooler to the processing factory in accordance to the *WI Bulk Milk Transport* (WI-009). At the moment of dispatch the QC (Processor) – who is based at the CBE – re-tests the milk for density and titratable acidity, as well as temperature, before releasing it for loading into the milk tanker as set out in the *WI CBE Dispatch + CIP* (WI-008). The QC (Processor) uses the dipstick of the bulk cooling tanks to confirm the milk volumes released into the milk tanker from the CBE milk cooler.

The Bulk Tanker Driver confirms that the milk volume in the tanker is correct before properly sealing the lids of the milk tanker compartments to avoid any spillage in transit. He also ensures he is released on time to deliver the milk to the Processor as soon as possible.

Upon dispatch and once the Bulk Tanker Driver is ready to depart, the QC (Processor) issues a *Bulk Tanker Dispatch Note* (RP-008A), which states the time of departure and is signed by both Bulk Tanker and the Quality Controller (Processor). Upon arrival at the Processor's platform the arrival time is recorded by the QC (Processor). The *Bulk Milk Dispatch Note* (RP-008A) is report daily to the Project Manager and Production Manager.[4]

Upon arrival at the milk reception platform of the Processor, the Bulk Tanker Driver informs the QC / Lab Technician (Processor) of his arrival for milk grading and hands over the *Daily CBE Milk Dispatch Record* (RP-008) and the *Bulk Tanker Dispatch Note (time record)* (RP-008A).

e. Milk reception and milk testing at the Processor Platform

The QC/ Lab Technician is responsible for the milk reception at the Processor's reception platform, including the milk sample taking and reporting. The guidelines are stipulated in the *WI Milk Reception Processor Platform* (WI-010). The QC / Lab Technician also generates the *Daily Platform Analysis Form* (RP-009) after milk reception activities and reports these to the Project Manager and Production Manager.

Milk that passes all the set quality parameters is received and pumped from the milk tanker into the factory receiving tanks for processing.[5]

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[4] *Still under development at the time of publishing the first edition of this Manual*

[5] *A procedure that shows how to deal with rejected milk (antibiotic positive) is shown in DR-001 and DR-002.*

Work Instructions (Flow Chart 2 – *Milk collection procedure*)

Milk Collection

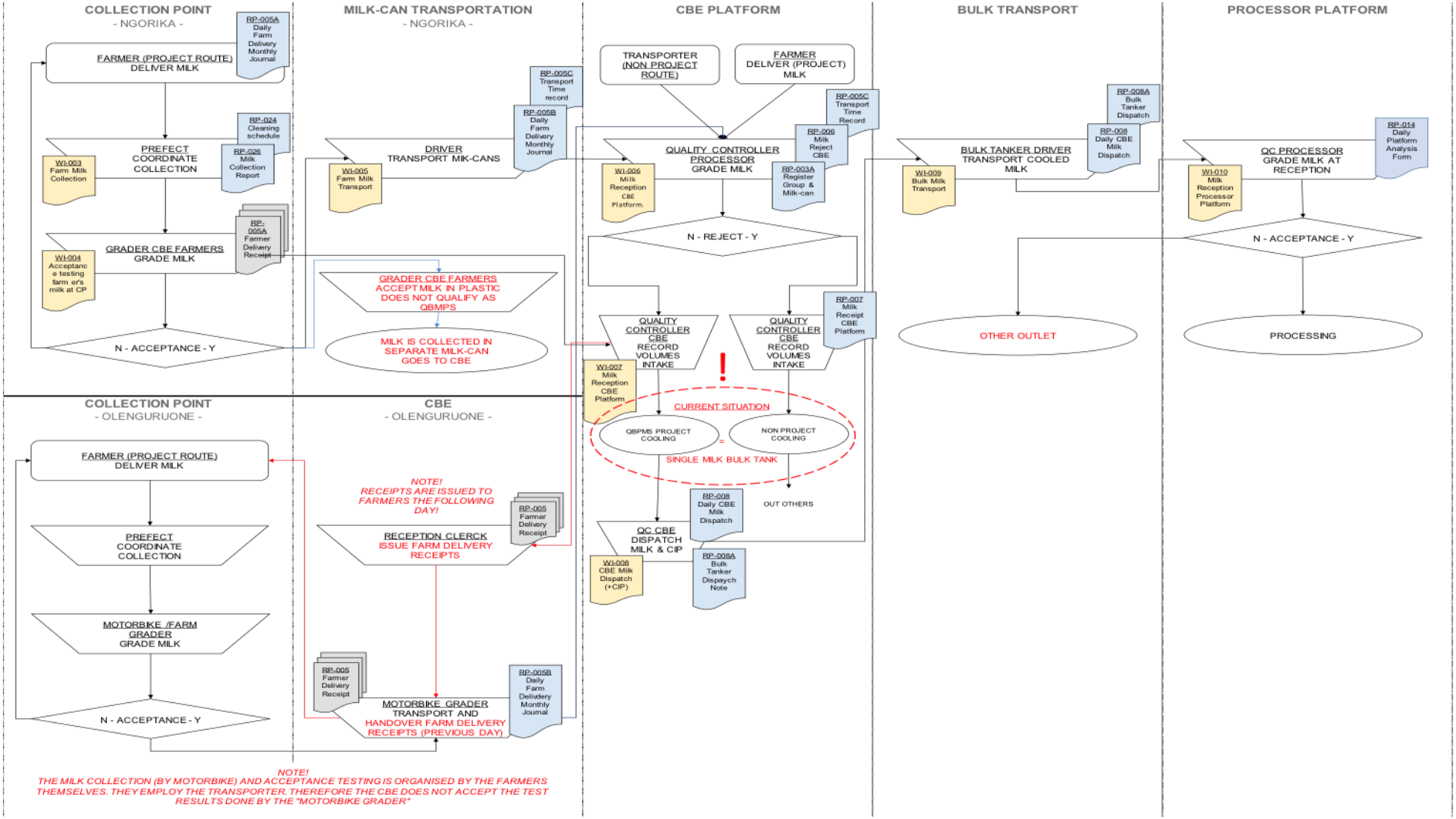
RP No.	Name WI	Job function
WI-003	Farm Milk Collection	Prefect
WI-004	Acceptance Testing Farmers' Milk at CP	Grader Farmer (CBE)
WI-005	Farm Milk Transport	Transporter (CBE)
WI-006	Milk Reception CBE Platform	QC (Processor)
WI-007	Milk Reception CBE Platform	QC (CBE)
WI-008	CBE Milk Dispatch + CIP	QC (CBE)
WI-009	Bulk Milk Transport	Bulk Tanker Driver
WI-010	Milk Reception Processor Platform	QC (Processor)

3.2.6 Records and Reports

Milk Collection records and reports

RP No.	Name WI	Job Function
RP-005A	Daily Farm Delivery Monthly Journal	Grader Farmer
RP 005B	Daily Farm Delivery Monthly Journal	Grader Farmer
RP 005C	Transport Time Record	Transporter (CBE)
RP-006	Milk Reject CBE Platform	QC (CBE)
RP-007	Milk Receipt CBE Platform	Grader (CBE)
RP-008	Daily CBE Milk Dispatch	QC (CBE)
RP-008A	Bulk Tanker Dispatch Note	Bulk Tanker Driver
RP-009	Daily Platform Analysis Form	Quality Controller (Processor)
RP-024	Cleaning Schedule	Prefect / CPO
RP-026	Milk Collection Report	Prefect / CPO
RP-027	Vehicle Repair Request	Transporter

3.2.7 Flow Chart 2: *Milk Collection Procedure*



3.3 QUALITY CONTROL

3.3.1 Purpose

The quality control procedure describes in detail how milk sampling is organised for both bulk deliveries and the different farmer groups (milk cans). It further explains how quality analysis results are recorded and reported to the relevant functions responsible for verifying the results and processing milk payments.

3.3.2 Scope of operations

This procedure describes the preparation of milk samples at different sample collection points in the milk collection chain. In addition, it explains the process used for milk quality analysis and reporting.

3.3.3 Reference

In developing the milk quality control procedure, the following documents have been used as references:

- Minutes of project meetings with CBEs, *dated 26 July 2016*
- Happy Cow Company Directives *DR-002*
- Happy Cow Quality Manual 2017

3.3.4 Definitions

The following abbreviations are used in this procedure:

CBE	Cooling and Bulking Enterprise
MCC	Milk Chain Coordinator
MQT&T	Milk Quality Tracking & Tracing
QBMPS	Quality-Based Milk Payment System
QC (CBE)	Quality Controller at the CBE Platform
QC (Processor)	Quality Controller at the Processor Platform
RP	Record and Report
WI	Work Instruction

3.3.5 Description of the procedure

a. <u>Preparation of the milk samples</u>

Every month the QC/ Lab Technician (Processor) prepares the QBMPS milk sampling schedule, titled *Daily Platform Analysis Register* (RP-010). He/she shares the schedule with the Project Managers, QCs and MCCs at the CBE Platforms.

The QC (Processor) then prepares the milk sample bottles as set out in the *WI Processor Milk Sample Handling* (WI-011A). At his moment care must be given that the samples are well identified for the sample takers (Graders) and that samples from farm groups are not routinely taken but at random, meaning that farmer groups are not aware when their group milk will be sampled.

b. Milk sample taking at CBE Platform
The QC (CBE) receives the sampling bottles from the QC (Processor) through the Bulk Tanker Driver and collects the QBMPS milk can samples as set out in the *WI CBE Milk Sample Taking* (WI-012A).

c. Milk sample taking at Processor Platform
The QC (Processor) also collects the QBMPS milk samples from the Bulk Tanker Driver as set out in the *WI Processor Milk Sample Taking* (WI-011B).

d. Milk sample analysis at the CBE Lab
The QC Processor (stationed at the CBE) analyses the QBMPS milk can samples in the CBE Laboratory as set out in the *WI CBE Milk Sample Analysis* (WI-012B). The QC (CBE) then generates two reports, *CBE Daily Analysis Results* (RP-013) and the *CBE Monthly Analysis Results* (RP-012A/B) and forwards them to the Project Manager: RP-013 on a daily basis, and RP-012 on a monthly basis.

e. Milk sample analysis at the Processor Lab
The QC/Lab Technician (Processor) receives the QBMPS milk can and milk cooler samples from the QC (CBE) through the Bulk Tanker driver. The QC Processor then analyses the QBMPS milk samples as set out in the WI Processor Milk Sample Analysis (WI-011C). Following the analysis, the QC / Lab Technician (Processor) produces two reports, the Lab Report (RP-011) and the QBMPS Report (digital) (RP-011A). The QC (Processor) then reports to the Project Manager (Processor) by sharing two reports in digital format: QBMPS Report (RP-011A) and the CBE Monthly Analysis Results (RP-012A). The two digital reports are based on the original/field versions of these records, RP-011B and RP-012B respectively.

3.3.6 **Work Instructions**

Quality Control Work Instructions

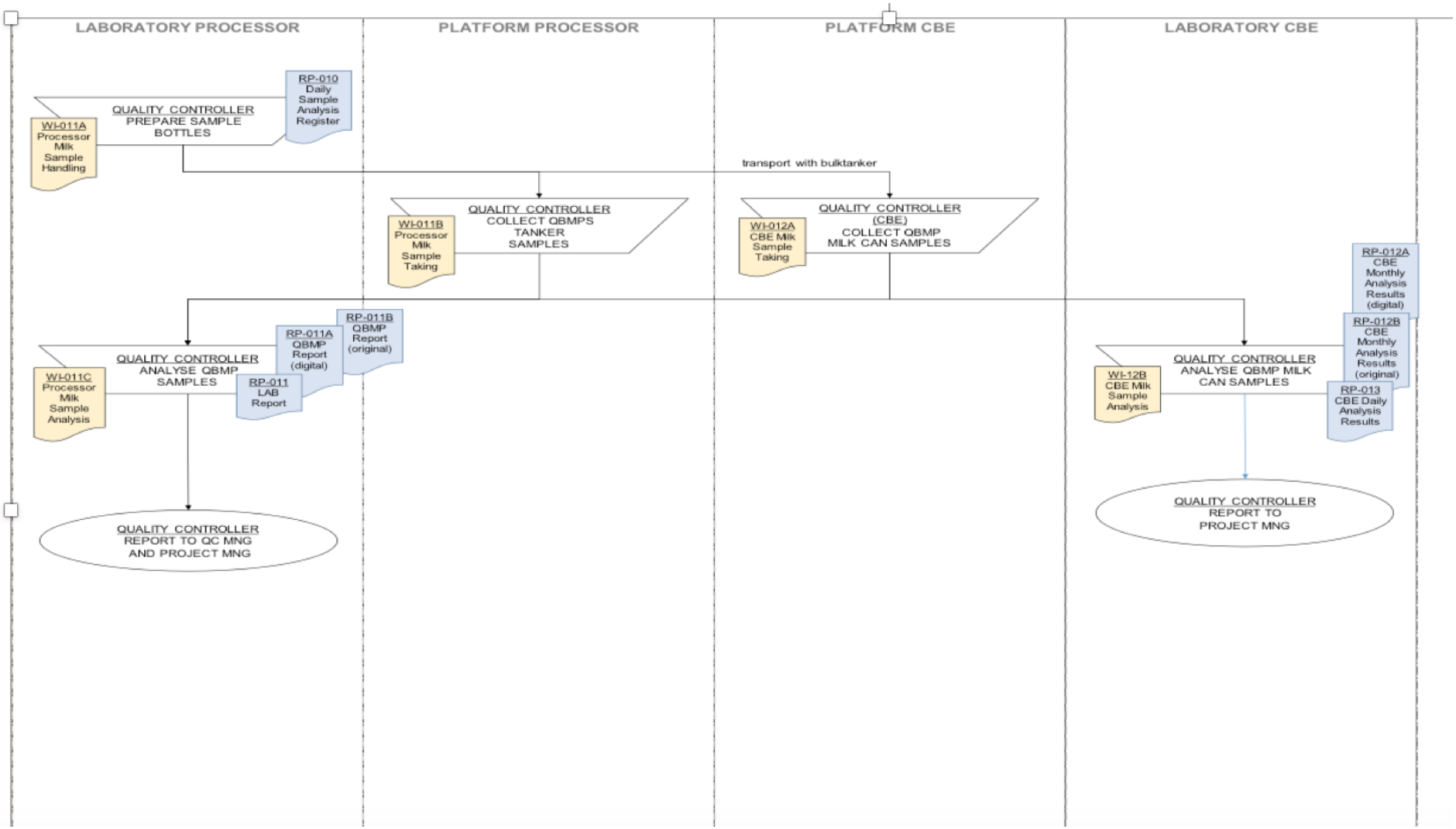
Rep. No.	Name	Job function
WI-011A	Processor Milk Sample Handling	QC (Processor)
WI-011B	Processor Milk Sample Taking	QC (Processor)
WI-011C	Processor Milk Sample Analysis	QC (Processor)
WI-012A	CBE Milk Sample Taking	QC (CBE & Processor)
WI-012B	CBE Milk Sample Analysis	QC (Processor)

3.3.7 **Records used**

Quality Control records and reports

Rep. No.	Name	Job function
RP-010	Daily Sample Analysis Register	QC (Processor)
RP-011	Lab Report	QC (Processor)
RP-011A	QBMPS Report (digital)	QC (Processor)
RP-011B	QBMPS Report (field report)	QC (Processor)
RP-012A	CBE Monthly Analysis Results (digital)	QC (CBE)
RP-012B	CBE Monthly Analysis Results (field report)	QC (CBE)
RP-013	Daily Analysis Results	QC (CBE)

3.3.8 Flow Chart 3: *Milk Quality Control Procedure*



3.4 QUALITY-BASED MILK PAYMENTS

3.4.1 Purpose

The milk payment procedure is designed to ensure that farmers are paid for their milk in accordance to the volumes they have delivered over a certain period of time. In addition, this procedure must guarantee that the milk qualities delivered by different farmer groups are processed accurately and that a bonus payment can be allocated accordingly. The bonus payment is a way of motivating farmer groups to supply milk whose quality is above that of "Non Project Milk."

3.4.2 Scope of operations

This procedure describes the milk payment processes as agreed upon between the processor and the CBEs, being applicable for the milk that is delivered in bulk from the CBE to the processor. It also applies to processes that are required to identify the milk quality from different farmer groups in order to determine who should receive a bonus.

3.4.3 References

In developing the milk payment procedure, the following documents have been used as references:

- Minutes of project meetings with CBEs, dated 04 July 2016
- Happy Cow Company Directives DR-001 and DR-002
- Happy Cow Manual 2017

3.4.4 Definitions

CBE	Cooling and Bulking Enterprise
MQT&T	Milk Quality Tracking & Tracing
QBMPS	Quality-Based Milk Payment System
QC	Quality Controller
RP	Record & Report
WI	Work Instructions

3.4.5 Description of the procedure

Payment is organised in two separate events:

A. Ordinary milk payment to a CBE
B. Bonus payment to farmer groups

Ordinary milk payments (A) concern payment for bulk deliveries from a CBE to the processor, which are not subject to a bonus payment and thus receive the common milk price. A separate payment is organised for farm groups whose milk can(s) are sampled before bulking. In such cases, payment is based on the results of milk quality analyses of the corresponding milk cans (farmer groups). The following sections describe the processes used for quality control and milk analysis.

A. PAYMENT OVER BULK DELIVERIES

a. Reporting volumes and quality analysis results

The QC (Processor) makes daily reports about the milk volumes received at the Processor Platform. He/she reports on milk volumes, as well as the milk analysis results, to the Quality Control Manager and the Finance Manager by means of the *Daily Platform Analysis Form* (RP-014). The actions of the QC (Processor) are guided by the *WI Reporting QC Processor* (WI-013).

The Quality Control Manager prepares the *Monthly Platform Analysis Form* (RP-015 soft copy) in which all the daily records of the corresponding month are summarised, and reports to the Finance Manager.

b. Invoicing monthly milk deliveries by the CBE to the Processor

At the end of the month each CBE raises an invoice to the Processor against the total bulk milk delivered as recorded in the *Daily CBE Milk Dispatch Records* (RP-008). This information is used to generate a monthly report, the *Monthly CBE Dispatch Record* (RP-016), which is sent to the Processor together with the corresponding invoice.

c. Preparing payment of CBE invoices by Processor

Upon receipt of the *Monthly CBE Dispatch Report* (RP-007) the Finance Manager (Processor) cross-checks the CBE invoice against the *Monthly Platform Analysis Report* (RP-006) received from the QC Manager. After addressing any volume discrepancies, the CBE invoice is approved for payment. The Finance Manager prepares a bank cheque, which is signed by three signatories prior to forwarding to the CBE for payment.

B. BONUS PAYMENT

a. QBMPS qualification (bonus) verification by Project Manager

The Project Manager (Processor) is responsible for monitoring the milk qualities and verifying which farmer groups (milk cans) comply with the qualities required to qualify for bonus payments. The Project Manager checks and verifies three reports:

- Laboratory Report (RP-011)
- QBMPS Report (RP-011A&B) and
- CBE QC Monthly Analysis Report (RP-012A&B)

The Project Manager emails two reports (RP-011) and (RP-011A) – as RP-011 in CVS format – to the CBE Accountant. The instructions for this are set out in the *WI Reporting PM Bonus Payment* (WI-014).

Verification is also an important step in identifying milk cans that **do not** meet the agreed quality parameters (Company Directive DR-002) and are thus not applicable for a bonus payment. This is because the QBMPS quality parameters are analysed and obtained only twice in each month.
Since QBMPS samples are only taken and analysed two times each month, a milk can may still not be eligible for bonus payments even if it is accepted after the QBMPS lab analysis. This is because the QBMPS project partners agreed that if a milk can was rejected at the CBE platform even once during the month, as recorded in the *CBE Daily Analysis Results* (RP-020), the farmers should not get a bonus. Verification is therefore important to ascertain the milk cans that are to get the bonus.

b. Invoicing QBMPS bonus by CBE
Upon receiving the email containing the *Email +QBMPS Report (CSV)* (RP-021), the CBE's Accounts Clerk of New Ngorika prepares the QBMPS Bonus Report CBE (RP-022) while in Olenguruone the Accounts Clerk deducts 20% of the QBMPS Bonus payment for which an invoice is issued to pay the Motorbike Transporters for their contribution is achieving a qualification payment of farmer's group milk. This is reported in report *Bonus for Motorbike Transport* (RP-022A). The Accounts Clerk attaches the bonus payment invoice to these reports as set out in the *Bonus Payment Calculation CBE* (WI-015) work instruction. The CBE invoice together with the two reports (RP-022 and RP-022A) are addressed to the attention of the Finance Manager Processor.

c. Verification by Finance and Project Managers (Processor) of CBE inputs
The Finance Manager (Processor) hands over the invoice and the two reports received from the CBEs: *QBMPS Bonus Report CBE* (RP-022) and *Motorbike Transport* (RP-022A) to the Project Manager (Processor) for verification. The Project Manager cross-checks the reports as set out in the *WI Reporting PM Bonus Payment* (WI-014). If there is a discrepancy, the documents are returned to the CBE Accounts Clerk for correction. If there is no discrepancy, the Project Manager approves and hands over the documents to the Finance Manager for further cross-checking on payment amounts.
The Project Manager further verifies that: the listed qualifying milk cans are as recommended in the reports; the bonus type is as recommended in the reports (either premium or standard); and the bonus price is correctly calculated.
The Finance Manager also cross-checks the bonus payment reports (RP-022 and RP-022A)) and the attached invoice from the CBE. If satisfied with the volumes and the amounts, the Finance Manager approves the invoice for payment. He/she then prepares a payment voucher and organises for the signatures of the Director and the Project Manager. The Finance Manager then prepares a bank cheque to the CBE for payment of the bonus to the qualifying farmers.

3.4.6 **Work instructions**

Milk Payment Work Instructions

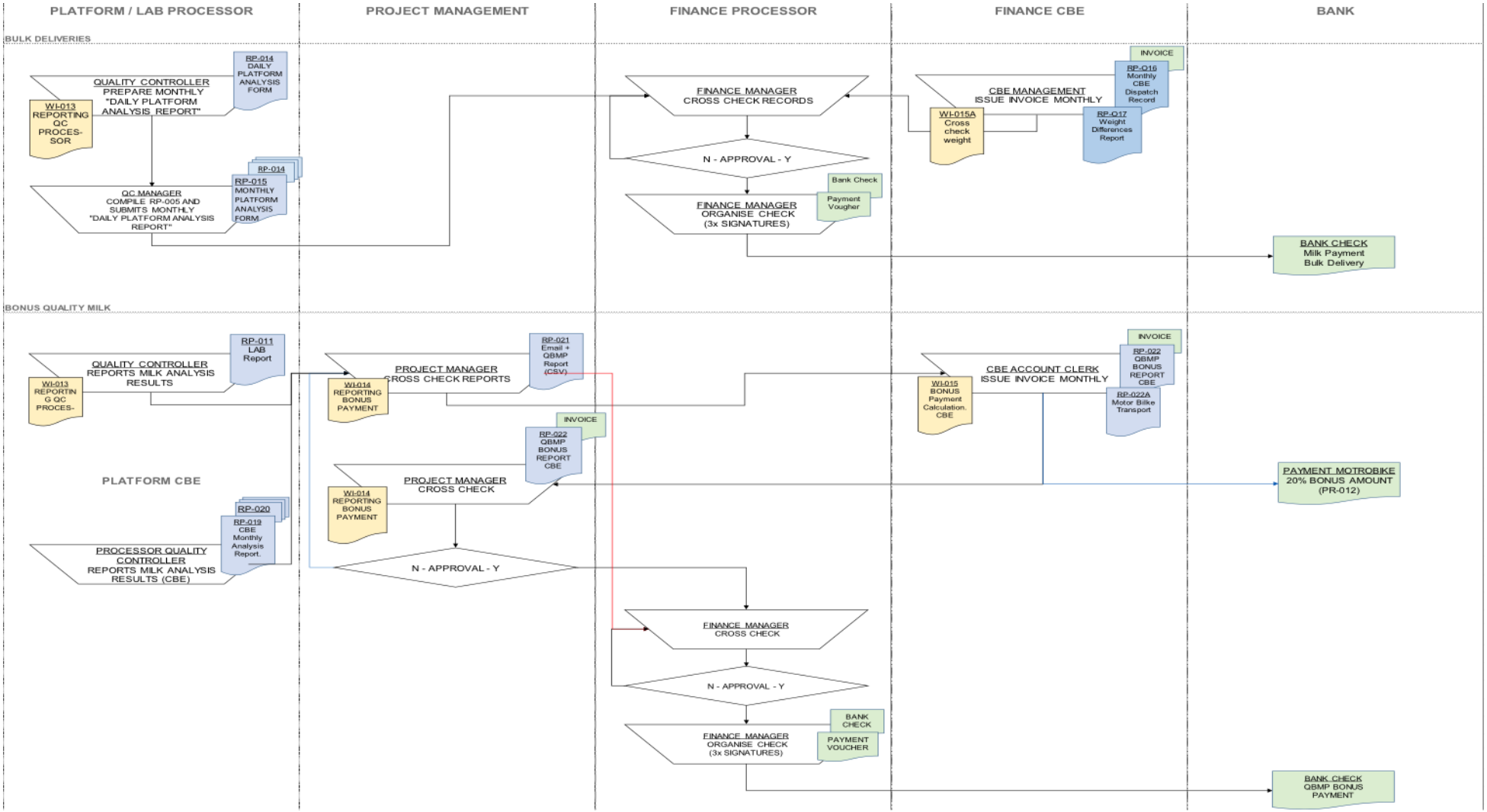
Rep. No.	Name	Job function
WI-013	Reporting QC (Processor)	QC (Processor)
WI-014	Reporting Bonus Payment	Project Manager
WI-015	Bonus payment calculation CBE	Accounts Clerk (CBE)
WI-015A	Bonus payment listing	Accounts clerk

3.4.7 **Records used**

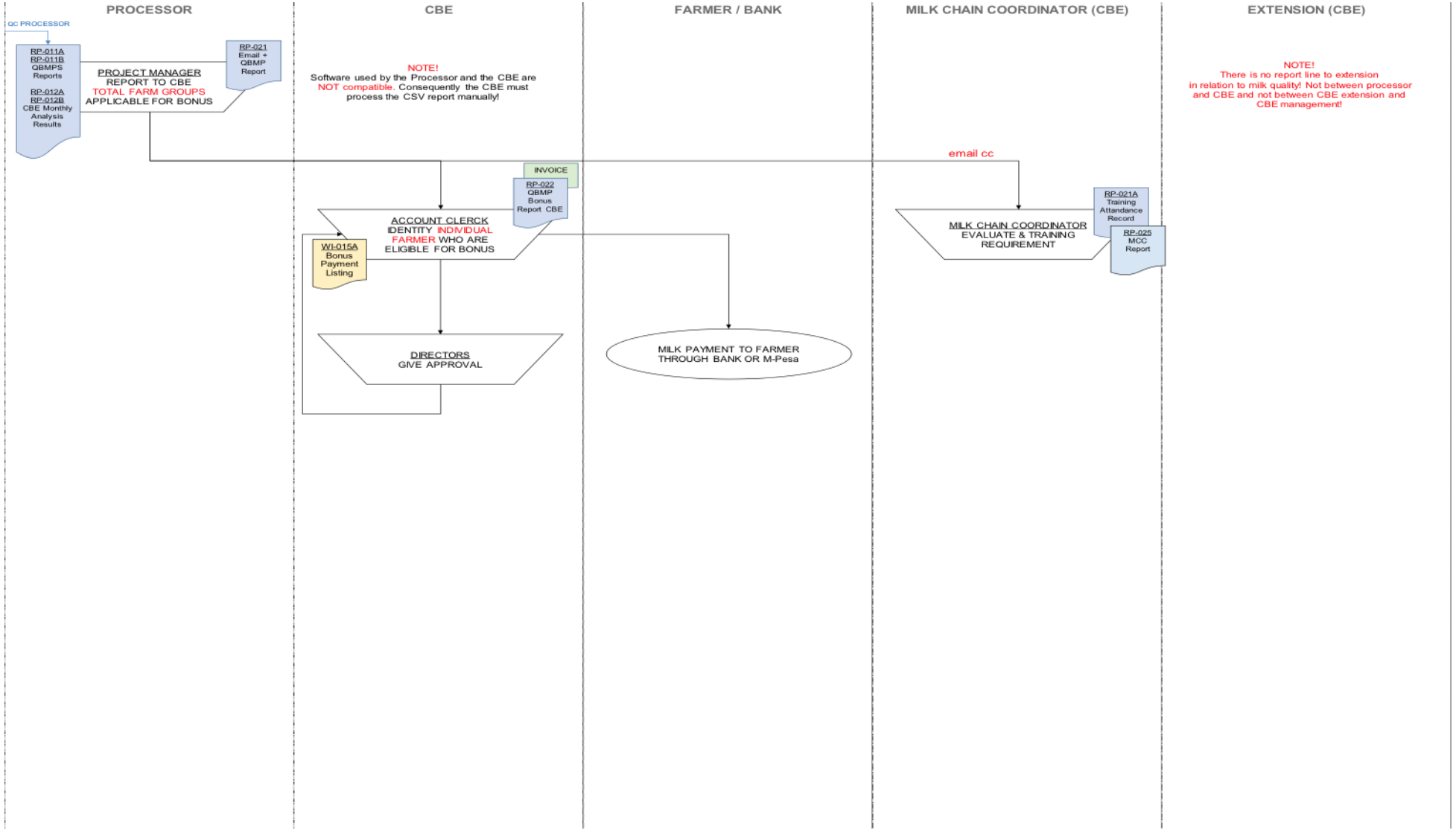
Milk Payment records and reports

Rep. No.	Name	Job Function
RP-006	Milk Reject CBE Platform	QC (CBE)
RP-007	Milk Receipt CBE Platform	Grader (CBE)
RP-008	Daily CBE Milk Dispatch	QC (CBE)
RP-014	Daily Platform Analysis Form	QC (Processor)
RP-015	Monthly Platform Analysis Form	QC (Processor)
RP-016	Monthly CBE Dispatch Record	Accounts Clerk (CBE)
RP-017	Weight Difference Report	Accountant (CBE)
RP-018	Open	-
RP-019	CBE Monthly Analysis Report	Processor QC (CBE)
RP-020	CBE Daily Analysis Results	Processor QC (CBE)
RP-021	Email + QBMPS Report (CSV)	Project Manager
RP-021A	Training Attendance Record	MCC
RP-022	QBMPS Bonus Report CBE	Accounts Clerk (CBE)
RP-022A	MotorBike Transport	Accounts Clerk CBE
RP-025	MCC Report	MCC

3.4.8 Flow Chart 4A: Milk Payment Procedure



Flow Chart 4B: Milk Payment – *Bonus Payment Procedure* (detail)



ANNEXES

A. Job descriptions

B. Work Instructions

C. Company and Project Directive

ANNEX A. JOB DESCRIPTIONS

JD-001: Project Manager (Processor)

Job Title:	Project Manager
Department:	Dairy Operations
Location:	Happy Cow
Reporting to:	Director Processor
Name of Post Holder:	
Employee No:	

The Project Manager oversees all dairy affairs – such as milk collection operations – in cooperation with business partners (CBEs) and secures the intake of milk that meets the company's milk quality standards. He/she Implements the operations strategy concerning milk volumes and dairy farm development in accordance to company directives.

Primary responsibility
Reporting to the Director, the Project Manager/Dairy Operations Manager will be in charge of all dairy affairs of milk collection operations, including CBE operations, quality control and milk payments in accordance to company directives

Duties and responsibilities:

1. Manage the Operations Section/Department.
2. Manage the milk collection system, purchasing method and quality control of raw milk.
3. Design and make available professional support services organised by the company to dairy farmers in cooperation with business partners (CBEs).
4. Provide a dairy development / milk collection strategy.
5. Identify, develop, organise and implement dairy extension (in line with partners' CBE policies)
6. Manage staff development.
7. Produce periodical production, budget and planning reports.

Date signed for acceptance : ……

Dairy Operations Manager : ……. Signature: ……..

Director : ……. Signature: ……..

Human resource manager : …….. Signature: ……..

JD-002: Quality Controller / Lab Technician (Processor)

Job Title:	Quality Control/Laboratory Technician
Department:	MQT&T Project
Location:	Happy Cow Lab
Reporting to:	Project Manager
Name of Post Holder:	
Employee No:	

The Quality Controller / Lab Technician oversees quality control operations of raw milk quality analysis at Happy Cow and facilitates the QBMPS through generating reports to guide the awarding of bonuses to farmers in specific milk cans.

Primary responsibility
Reporting to the project manager, the Quality Controller will be in charge of the laboratory at Happy Cow Ltd. He/she will also be responsible for grading milk at Happy Cow, sampling for the QBMPS and keeping quality analysis records. The QC is further tasked with preparing and submitting reports to the management in line with the required standards and time frame.

Duties and responsibilities:
1. Perform milk acceptance and laboratory tests at Happy Cow and weigh the quantities of milk at the reception platform.
2. Prepare and analyse samples from the CBEs (or any other source, such as Qlip, KEBS etc.) especially on the quality-based parameters. Execute the analysis of raw milk according to the approved procedure, work instructions and professional standards, including for quality-based milk payments.
3. Review quality analysis data and keep up-to-date records with relevant scientific and technical developments.
4. Keep milk sample analysis results confidential and report only for processing of milk payment purposes within set disciplines and timelines.
5. Maintain a professional level of hygiene in the laboratory.
6. Secure the operation, maintenance and calibration of all equipment at Happy Cow and at the CBEs through liaising with the QC (CBE).
7. Take administrative stock control for all consumables in the laboratory at Happy Cow and at the CBEs (including expiry and storage conditions).
8. Report on all the developments in the laboratory and compile QBMPS and laboratory monthly reports, including all the achievements, challenges and possible solutions for the project.
9. Replace the QCs (when called upon) for their off day at the CBE laboratory.
10. The quality control person can be assigned any other duties as deemed by the top management of Happy Cow Ltd.

Date signed for acceptance: ……

Quality controller : …… Signature: ……

Project manager : …… Signature: ……

Human resource manager: …….. Signature: ……

JD-003: Bulk Tanker Driver

Job Title:	Bulk Tanker Driver
Department:	Administration/Production
Reporting to:	Production manager
Employee's Name:	
Employment No:	

The Tanker Driver is responsible for transporting milk and milk samples from the CBE premises to the Happy Cow processing factory.

Duties and Responsibility

1. Drive the Company's vehicle in order to deliver/collect Happy Cow products within the timelines stipulated.
2. Ensure that the tanker has undergone a full Cleaning In Place (CIP) before leaving the factory to the CBEs for raw milk collection. The vehicle should be clean at all times.
3. Observe the smell and physical appearance of the milk before accepting it. Check the milk density using the lactometer and reject milk that is below the required density.
4. Sign the delivery note during dispatch at the CBE and handing it over to the QC on arrival at the factory.
5. Carry the cool box with sampling bottles to the CBE and hand them over to the QC (CBE). Thereafter, bring the cool box with the samples back to the factory and hand it over to the QC (Processor).
6. Update the log book of the vehicle use on a daily basis for proper recording of mileage.
7. Carry out safety checks of the vehicle on a daily basis to ensure road worthiness and safekeeping of vehicle accessories (e.g. Jack, first aid kit, etc).
8. Report periodic servicing needs of the vehicle in advance to ensure its proper handling.
9. Ensure that all immediate actions required by rules and regulations are taken in case of involvement in an accident.
10. Undertake any other duty that may be assigned by the management.

Date signed for acceptance: ……

Employee's Signature: ……..…… **Signature: ……....**

Human Resource Manager: …… **Signature: ……**

Production Manager: …… **Signature: ……**

JD-004: Milk Payment Administrator (Processor)

Job Title:	Finance administrator
Department:	MQT&T Project
Location:	Happy Cow Ltd.
Reporting to:	Directors
Name of Post Holder:	

The Finance Administrator oversees bulk raw milk payments and QBMPS bonus award to the CBEs.

Primary responsibility

Reporting to the directors, the Finance Administrator will oversee raw milk and bonus award payments to the CBEs. Moreover, he/she will cross check the quantity delivered and the invoices raised by the CBE accounts clerk before payments.

Duties and responsibilities:

1. Cross-checking the monthly invoices raised by the CBE against the delivery notes and actual daily deliveries report shared with the Quality Control Manager before executing payments.
2. Liaising with the project manager to facilitate availing bonus award amount to the CBE.

Date signed for acceptance: ……

Finance Manager: …… **Signature: ……**

Human Resource Manager: …… **Signature: ……**

Director: …… **Signature: ……..**

JD-005: Processor Milk Quality Controller (CBE)

Employed by Processor and stationed at the CBE

Job Title:	Processor Quality Control / Laboratory Technician
Department:	MQT&T Project
Location:	CBE
Reporting to:	Project Manager (Processor)
Name of Post Holder:	

The Quality Controller oversees the milk quality analysis at the cooling plants, carries out sampling and analysis for the QBMPS and facilitates the milk quality tracking and tracing system along the collection routes.

Primary responsibility
Reporting to the Project Manager, the Quality Controller will be in charge of the CBE laboratory, grading the milk at the cooling plant, sampling for the QBMPS and keeping quality analysis records.

Duties and responsibilities:

1. Perform milk acceptance tests, weighing and bulking into the storage cooling tank as well as dispatching to Happy Cow. In addition, the QC should oversee appropriate can ownership at the reception platform.
2. Carry out sampling for the QBMPS project and execute the analysis of raw milk according to the approved procedure, work instructions and professional standards.
3. Review quality analysis data and keep up-to-date records with relevant scientific and technical developments.
4. Based on analysis results, identify farmers' training needs for achieving the project objectives and mission through liaising with the MCC and the training and extension officer.
5. Keep milk sample analysis results confidential and report only for processing of milk payment purposes within set disciplines and timelines.
6. Carry out administrative stock control for all consumables in the laboratory (expiry and storage conditions).
7. Secure the operation, maintenance and calibration of all equipment in the laboratory.
8. Maintain a professional level of hygiene in the laboratory, cooler room and the CBE compound at large.
9. Report on developments at the CBE level on a weekly basis and compile a monthly report including all the achievements, challenges and possible solutions for the project.
10. Undertake any other duties assigned by the management of Happy Cow.

Date signed for acceptance: ……

Quality Controller: ……. **Signature: …….**

Project Manager: …….. **Signature: …….**

Human Resource Manager: …… **Signature: …….**

JB-006: Milk Chain Coordinator (CBE)

Job Title:	Milk Chain Coordinator
Department:	MQT&T Project
Location:	CBE
Reporting to:	CBE Manager (to be confirmed)
Name of Post Holder:	

The Milk Chain Coordinator oversees the milk quality grading, weighing and coordination at the CBE collection points/ routes for the QBMPS.

Primary responsibility
Reporting to the Project Manager, the MCC Coordinator will be in charge of the CBE milk collection activities, including: grading and weighing of the milk at the collection points; keeping records of the milk quality at all times; and liaising with the transporters/graders to facilitate quick collection and delivery to the cooling plant. This will be followed by organising and conducting farmers' training according to the training needs identified. The MCC Coordinator also prepares and submits reports to the management in accordance with agreed standards and reporting times.

Duties and responsibilities:
1. Observe and report on the process of raw milk collection (handling, sampling/testing protocols and equipment being used) along the collection routes and ensure that the right practices are observed.
2. Carry out sampling at the field level and give feed back to the farmers concerned on the sampling results.
3. Make requisitions for all the requirements on behalf of the farmers, graders/prefects, transporters and keep records of the utilisation of the consumables.
4. Carry out follow up to ensure that milk grading and sampling is carried out in an appropriate manner at all the collection points for every route.
5. Harmonise milking times and deliveries to facilitate quick and timely milk collection along the routes.
6. Ensure that the collection point structures are in use and are hygienically maintained at all times (cleaning, water in the trough and locked).
7. Organise the farmers/graders/transporters training towards the project objectives and mission i.e. clean milk production, quality tests and their implications, dairy husbandry, management and animal health etc. depending on the identified needs. Make available the training catalogues together with the reports.
8. Liaise with the quality control personnel and the training and extension officers when facilitating training.
9. Give a weekly report on all the route activities describing the expected outputs and achieved output, and share the work plan for the coming week to ease facilitation.
10. Compile a monthly report on all the issues observed during the month.
11. Carry out any other duties assigned by the top management (Happy Cow Ltd. /CBE).

Date signed for acceptance: ……

Milk Chain Coordinator: …….. **Signature: ……**

Manager: …….. **Signature: ……**

JD-007: CBE Grader (Farm Level)

Job Title:	Milk Grader (Farm Level)
Department:	Milk collection
Location:	CBE route
Reporting to:	CBE Manager (to be confirmed)
Name of Post Holder:	

The Milk Grader oversees grading and weighing of the milk at the farm level along the collection routes.

Primary responsibility

Reporting to the CBE Manager, the Grader will act as a link between farmers and the CBE. He/she will be responsible for grading, weighing and recording of the milk at the collection routes as well as anticipating the input requirements of the farmers.

Duties and responsibilities.

1. Liaise with the Bulk Tanker Driver to load respective clean milk cans on the lorry/tractors in preparation for milk collection.
2. Grade (accept or reject) and weigh the milk on a daily basis for every farmer before bulking in the respective milk cans.
3. Ensure that the grading reagents and equipment are in good condition.
4. Ensure separation of morning and evening milk during transportation.
5. Record the results of analysis and quantities received in the journals and farmers' cards.
6. Ensure faster collection by reducing delays in the collection chains and maintaining hygiene during delivery.
7. Deliver information from the office (whether verbal or written) to the farmers and vice versa in the respective routes.
8. Off load the milk, follow-up on quantities received and oversee the acceptance and rejection of milk at the reception platform.
9. Deliver the farm inputs to the respective farmers.

Date signed for acceptance: ……

Quality Controller: …….. **Signature: ……..**

Manager: …….. **Signature: ……..**

JD-008: Quality Controller (CBE)

Job Title:	Quality Controller at the reception platform
Department:	Milk collection
Location:	CBE (name)
Reporting to:	CBE Manager
Name of Post Holder:	

The Quality Controller oversees the weighing and grading of raw milk at the cooling plant's reception platform. He/she also checks the total quantity collected along the collection routes and dispatched to various customers.

Primary responsibility
Reporting to the manager, the quality controller will be in charge of the CBE reception platform activities including keeping quantity and quality records.

Duties and responsibilities:
1. Oversee the weighing and bulking of raw milk received from individual farmers into the attached cans as well as further bulking into the storage cooling tank.
2. Keep up to date records in line with the duties assigned.
3. Maintain high levels of hygiene at the reception platform, cooler room and the CBE compound at large.
4. Dispatch raw milk to the customers as advised by the management.
5. Undertake any other duties assigned by the top management of Happy Cow Ltd.

Date signed for acceptance: ……

Quality Controller: ……. **Signature: …….**

Manager: …….. **Signature: …….**

JD-009: Transporter (CBE)

From CP to CBE

Job Title:	Transporter
Department:	Milk collection
Location:	CBE (name) and route (identification)
Reporting to:	CBE Manager
Name of Post Holder:	

The Transporter is responsible for ensuring fast and efficient milk collection from farms along the collection routes.

Primary responsibility

Reporting to the Manager (CBE), the Transporter will transport milk from the from the collection routes to the CBE cooling plant. He/she will also be responsible for grading, weighing and recording of the milk at the collection routes as well as delivering the input requirements of farmers.

Duties and responsibilities.

1. Grade (accept or reject) and weigh milk delivered by each farmer individually on a daily basis before bulking in the respective milk cans.
2. Ensure that the grading reagents and equipment are in good condition.
3. Ensure separation of morning and evening milk during bulking and transportation.
4. Record the results of analysis and quantities received in the journals and farmers' cards.
5. Ensure fast collection with no delays in the collection chains and maintain hygiene during delivery.
6. Deliver information from the office (whether verbal or written) to the farmers and vice versa on the respective routes.
7. Off load the milk, follow-up on quantities received and oversee the acceptance and rejection of milk at the reception platform.
8. Ensure that the motorbike/vehicle is cleaned daily after delivery of milk.

Date signed for acceptance: ……

Quality Controller: …….. **Signature: ……..**

Manager: …….. **Signature: ……..**

JD-010: Milk Payment Administrator / Clerk

Job Title:	Accounts Clerk
Department:	MQT&T Project
Location:	CBE (name)
Reporting to:	CBE Manager
Name of Post Holder:	

The Accounts Clerk oversees bulk raw milk payments as well as the QBMPS bonuses awarded to farmers

Primary responsibility

Reporting to the Manager (CBE), the Accounts Clerk will oversee bulk raw milk payments by the processor/customer as well as bonus award payments to farmers. On a daily basis, the Clerk will cross check the quantity delivered by the milk graders/transporters and compare it with the reception intakes.

Duties and responsibilities:

1. Prepare invoices to facilitate payments for the bulk raw milk by the processors/customers.
2. Prepare invoices and CSV files (showing the farmers name, supply number, milk quantity and can number) to facilitate bonus awards payment by the processor according to the QBMPS report shared by the Project Manager. This should be done on or before the 10th day of every month.
3. Facilitate the payment of bonuses to farmers by apportioning each farmer's amount based on the quantity and quality of milk delivered.

Date signed for acceptance: ……

Finance Manager: …… **Signature: ……**

Human Resource Manager: …… **Signature: ……**

Director: …… **Signature: ……..**

JD-011: Training and Extension Officer

Job Title:	Training and Extension Officer
Department:	Training and Extension
Location:	CBE (name)
Reporting to:	CBE Manager
Name of Post Holder:	

The Training and Extension Officer oversees the milk quality trainings conducted along the CBE routes as well as collection points for the MQT&T project.

Primary responsibility
Reporting to the Manager (CBE), the Training and Extension Officer will be in charge of sensitising farmers on good milk management practices, including: clean milk production; quality testing; dairy husbandry; proper use of antibiotics (withdrawal period); and keeping records on challenges experienced in maintaining milk quality or any other gaps identified.

Duties and responsibilities:
1. Make observations and provide advice on milk production and delivery practices at the farm level.
2. Develop a weekly plan on intended training activities for farmer groups.
3. Liaise daily with the Quality Controller (CBE) about any rejected or suspicious milk cans and offer advice/solutions to the farmers concerned.
4. Harmonise milking times and deliveries to ensure quick and timely milk collection on all the routes.
5. Mobilise farmers and organise their training so as to achieve the project's mission and objectives, including establishing training schools. This should be done in conjunction with the MCC and the Quality Controllers.
6. Give a weekly report on the challenges and achievements for all the milk collection routes. This should include an overview of milk rejected, noting the quantities, causes for rejection, the farmers concerned and the way forward.
7. Attend to issues relating to the health of dairy cows on behalf of the company/society.
8. Prepare and submit reports to the management according to the standards and required time.
9. Undertake any other duties assigned by the management.

Date signed for acceptance: ……

Training and Extension Officer: …… **Signature: ……**

Project Manager: …….. **Signature: ……**

Human Resource Manager: …… **Signature: ……**

JD-012: Prefect / Collection Point Operator

Job Title:	Prefect
Department:	MQT&T
Location:	CBE **(**name)
Reporting to:	CBE Manager (to be verified)
Name of Post Holder:	

The Prefect oversees operations at the Collection Points (CPs) located along the milk collection routes as assigned and organised by the CBE.

Primary responsibility
Reporting to the Manager (CBE) the prefect will ensure an organised milk collection process and appropriate hygiene measures at all CPs and enhance milk quality tracking and tracing through good management of can ownership.

Duties and responsibilities:
1. Maintain hygiene at the CPs (cleaning the floor, watering the trough etc,).
2. Grade milk using the provided testing equipment and reagents.
3. Follow up on can attachment and ownership.
4. Mobilise farmers for training.
5. Recruit and register new farmers.

Date signed for acceptance: ……

Prefect: …… **Signature: ……**

Manager: …….. **Signature: ……**

ANNEX B. WORK INSTRUCTIONS

WI-001: I&R of Suppliers/Groups and Regular Milk Deliveries (CBE)

1. Purpose

To assign a unique identification and registration number to suppliers in order to facilitate the required processes, such as milk quality analysis, collection of milk from farm groups and milk payments. This WI also explains additional administrative processes that are under the responsibility of the CBE administration.

2. Scope

CBE administration

3. References

CBE Directive DR-001

4. Definitions of terms

CBE	Cooling and Bulking Enterprise
HC	Happy Cow Ltd.
MCC	Milk Chain Coordinator
QBMPS	Quality-Based Milk Payment System

5. Descriptions of activities

a. Digital registration of new farmers

The Accounts Clerk inserts new farmers that have been registered by the MCC and reported to the CBE Accounts Clerk – as per the *Register Group and Milk Can Number Report* (RP-003) – into the computer software.

b. Prepare invoices for bulk payments

The Accounts Clerk prepares monthly invoices for the total volumes of milk supplied to the processor using the *Daily CBE Milk Dispatch* (RP-008).

c. **Prepare invoices for bonus awards under the QBMPS**

The Accounts Clerk (CBE) receives the *QBMPS Report* (RP-011A) from the Project Manager via email. He/she then prepares the invoice citing the milk can number and the farmers belonging to each milk can as per the reports shared and supported by the Project Manager's email. The *Suppliers List & Volumes Delivered Report* (RP-002) and the invoice are shared with the Project Manager (PM) for approval. In case the PM is not satisfied with the cans selected for bonus payment and the module applied for certain cans, the Accounts Clerk makes the required corrections, issues an updated RP-002 and raises a new invoice.

d. Execute payments to the CBE

The RP-002 and invoice is forwarded to the Project Manager for approval before being forwarded to the HC Finance Manager for payment. The Finance Manager counter checks the quantities, as indicated in the *Suppliers List and Volumes Delivered Record* (RP-002), before processing the payment as per the CBE invoice.

e. **Execute the payments to the farmer**

After payments have been received, the CBE Accounts Clerk apportions the money according to the quantity delivered and approved milk can bonus per month. The bonus amounts awarded should be clearly reflected on the farmer's monthly statement.

6. Report and Record templates

RP-002 Suppliers List & Volumes Delivered

QUALITY-BASED MILK PAYMENT SYSTEM
CBE Name & Happy Cow

Date: ……
Bonus type: ……. Payment rate: 80%

Can No.	Supply No.	Farmer's Name	Qty (Kgs)	Amount

RP-003 Register Group & Milk Can Numbers

QUALITY-BASED MILK PAYMENT SYSTEM
CBE Name & Happy Cow

Date: ……
CBE: ……

Can No.	Supply No.	Farmer's Name	Qty (Kgs)

WI-002: Coordinating Tracking & Tracing System

1. Purpose

To ensure the proper coordination and registration of farmers and farmer groups (milk cans) in order to establish a correct identification process that guarantees 100% tracking and tracing of daily milk deliveries by individual farmers and groups.

2. Scope

Issue of supplier number by CBE, formation of farmer groups (milk cans) and implementation of the QBMPS.

3. References

CBE Directive (DR-001)
HC Directive (DR-002)

4. Definitions and terms:

CBE	Cooling and Bulking Enterprise
CP	Milk Collection Point
DR	Directive
HC	Happy Cow Ltd.
MCC	Milk Chain Coordinator
QC	Quality Controller
RP	Report

5. Descriptions

a. Milk delivery from a new farmer

The Reception Clerk (CBE) advises new farmers joining the CBE to register with the Accounts Clerk (CBE). The Accounts Clerk prepares the *Issue Supply Number Record* (RP-001). The CBE Accounts Clerk then prepares the *Suppliers List & Volumes Delivered Record* (RP-002) and shares it with the Milk Chain Coordinator (MCC).

b. Formation of Farmer groups (milk can ownership)

The MCC prepares the *Register Group & Milk Can Number Report* (RP-003). This is based on the computer system information as supplied by the CBE administrator and shall allocate the farmer to a specific milk can, or create a new milk can and its members. Each farmer must be attached to a specific milk can as per the RP-003. The MCC then hands over RP-003 to the Prefect, who will in turn pin it on the wall of the CP. This ensures that farmers are aware of other members in their milk can. Each month the MCC develops a monthly report on the status of can attachment for both old and new farmers as per HC Directive 002.

c. Monitoring existing farmers who are already registered in the QBMPS

The MCC ensures that the quantities of milk delivered by farmers to a milk can are tracked on a monthly basis to establish that bulking is correctly done. This is based on observations made during morning visits and assessment of the Daily Farm Delivery Monthly Receipts (RP-005A) (digital) and the Daily Delivery Monthly Journals (RP-005B) (field).

d. Registering farmers who have (temporarily) stopped their milk deliveries

Farmers who have stopped their milk deliveries (for a given period), will be enrolled in the milk can attachment/ownership the same way as new farmers.

e. Handling excess milk deliveries by milk cans (delivery exceeds allocated storage/collection capacity)

In cases where a farmer (or group) delivers more than the anticipated volume, hence exceeding the allocated collection capacity (50 litre milk cans), the farmer with more milk (of the same group) will be allocated to another milk can with immediate effect as per CBE Directive (DR-001).

f. Review and follow up of bonus awards

The Project Manager copies the MCC in the email shared with the Project Manager for the award of QBMPS bonuses. This helps to facilitate the process of ascertaining the accuracy of tests that determine which farmers qualify for (or fail to get) the Bonus. In order to determine the qualifying farmers, the MCC will be guided by DR-001. The MCC should conduct random sampling of the farmers' statements to ensure that the bonus award is reflected correctly.

g. Verification of milk quality delivered by individual farmers

In case conflicts arise about the quality of milk delivered (between the Farmer and the Transporter, Grader or Prefect), or if a request is made by the lab, the MCC will collect samples from the group concerned for analysis by the CBE or HC Laboratory. MCC should personally communicate the results back to the farmers immediately after analysis has been done.

Prior to starting the verification process the MCC should clearly explain to the farmers the intention of collecting the samples. The MCC receives sampling bottles from the QC/Lab Technician to carry out sampling at the farm level and bring the samples back to the Lab for analysis. The MCC should ensure sterile conditions while collecting the samples and transport them in a cool box to avoid deterioration.

h. Monitoring milk collection

The MCC should monitor the transportation time schedule using *Time Schedule Milk Collection* (RP-023) of milk as well as the quality of operations of the collection points. The CP structures should be hygienically maintained at all times as per the *Cleaning Schedule* (RP-024). The MCC should harmonise milking times and deliveries thus ensuring quick and timely milk collection along the routes. The challenges encountered should be shared with the management for assistance with the appropriate recommendations and way forward.

i. Reports and work plans

The MCC will be expected to share a weekly work plan, the *Milk Collection Report* (RP-026) with the Manager (CBE), with a copy to the Project Manager (Processor). The work plan should include all the activities to be carried out as well as details of the expected outputs. Each month, the MCC will share the *Milk Chain Coordinator Report* (RP-025) further elaborating farmers' performance against the expected outputs contained in the weekly work plans. In case an output expected was not achieved, the report should elaborate on the suggested way forward to achieve the outputs for future reference.

6. Reporting templates

RP-001 Issue Supply Number

QUALITY-BASED MILK PAYMENT SYSTEM
CBE Name & Happy Cow

S/No.	Farmer's Name	Supply No.	Date

RP- 023: Time Schedule Milk Collection (per route)

QUALITY-BASED MILK PAYMENT SYSTEM
CBE Name & Happy Cow

S/No.	Collection Route	Time Taken	Approval

RP- 024: CP Cleaning Schedule

QUALITY-BASED MILK PAYMENT SYSTEM
CBE Name & Happy Cow

Date	Farmer' Name	Farmer's Signature

RP-025 Milk Chain Coordinator Report

QUALITY-BASED MILK PAYMENT SYSTEM
CBE Name & Happy Cow

Date	Activity/Place	Expected Output	Achieved Output	Remarks

RP-005A: Daily Farm Delivery Monthly Journal – Farmer (carbonated copy)

QUALITY-BASED MILK PAYMENT SYSTEM
CBE Name & Happy Cow

Milk Collection Route:
Farmer's name: ……. **Month: …….. 2018**

AM – Kgs	Member No.	PM - Kgs	Member No.	Date
				1
				2
				Etc.
Totals (Kgs):				
Amount (Ksh):				

RP 005B: Daily Farm Delivery Monthly Journal – Grader (original)

QUALITY-BASED MILK PAYMENT SYSTEM
CBE Name & Happy Cow

Milk Collection Route:
Farmer's name: ……. **Month: …… 2018**

AM – Kgs	Member No.	PM - Kgs	Member No.	Date
				1
				2
				Etc.
Totals (Kgs):				
Amount (Ksh):				

WI-002A: Training

1. Purpose:
To facilitate the training of new farmers after being registered by the CBE.

2. Scope:
Farmer training

3. References:
Directive (DR-001)

4. Definitions and terms:

MCC	Milk Chain Coordinator
CBE	Cooling and Bulking Enterprise

5. Descriptions:

a) Training the newly recruited members.
The MCC mobilises the newly registered farmers for training. The aim is to induct them on the operations of the CBE and inform them about the standards and requirements for delivering quality milk. Other training topics are determined as per DR-001.

b) Attendance list
The list of the farmers indicating the farmers that attended the training will be established during the trainings. The list will be established for every group training and/or individual farm visits. This lists should be available on request.

c) Training farmers that did not qualify for a bonus award
The Project Manager sends a copy of the monthly *QBMPS Report* (RP-011A) to the MCC. Trainings are then formulated based on the performance of the cans. The focus of the training for specific farmers is determined by analysing the parameters in which various milk cans have performed poorly. The training topics are described in DR-001.

d) Other trainings
In order to pass on relevant information and skills to farmers, other trainings will be organised, as required, in collaboration with the extension staff/input providers or other functional staff at the CBE. The MCC will pass the requirements in milk quality during such trainings.

6. Reporting templates

RP-xx Training attendance sheet (no report No. available)

QUALITY-BASED MILK PAYMENT SYSTEM
CBE Name & Happy Cow

Date	Farmer name/Supply No.	ID No.	Route	Farmer Signature

WI-003: Farm milk collection

1. Purpose

This Work Instruction is designed to facilitate well organised and efficient collection of milk that is delivered by farmers to a milk collection point (CP). It aims to ensure appropriate milk handling and hygiene at the CP as well as the implementation of a system to trace and track milk deliveries and milk quality through farmer group (milk can) ownership.

2. Scope

Operations at CPs that are located along the milk collection routes as organised by the CBE.

3. References

Happy Cow Ltd Quality Manual, version 01, dated Jan 2017
CBE Directive DR-001 version 01, dated 27 Mach 2018

4. Definitions

CBE	Cooling and Bulking Enterprise
CP	Milk Collection Point
CPO	Collection Points Operator
MCC	Milk Chain Coordinator

5. Description of activities

a. Maintaining CP cleanliness
   - The Prefect prepares and posts the *Cleaning Schedule - Collection Points* (RP-024) for farmers who deliver milk to that CP, as per the directive "CP Cleaning"
   - After RP-024 has been filled-up, the Prefect also hands over the record to the MCC for filing
   - The Prefect shall supervise farmers to ensure that they carry out their cleaning duties as set out in RP-024

b. Preparing grading tools as per directive DR-001.

c. Supervising CBE graders and farmers to bulk the milk in the correct milk can as per the *Register Farm Group & Milk Can Numbers* (RP-003).

d. Intercepting farmers who deliver their milk in non-approved plastic jerry cans and reporting this to the MCC **on a monthly basis**, through the *Milk Collection Report* (RP-026).

6. Report & Record templates

RP- 024: Cleaning Schedule (Collection Points)

QUALITY-BASED MILK PAYMENT SYSTEM ***CBE Name & Happy Cow***		
Date	**Farmer name**	**Farmer Signature**

RP-003: Register Farm Group & Milk Can Numbers

QUALITY-BASED MILK PAYMENT SYSTEM ***CBE Name & Happy Cow***			
S/No.	**Milk Can ID No.**	**Farmer's Name**	**Farmer Signature**

RP-026: Milk Collection Report

QUALITY-BASED MILK PAYMENT SYSTEM ***CBE Name & Happy Cow***			
S/No.	**Farmer's Name**	**Supply Number**	**Type of Container**

WI-004: Acceptance testing of farmers' milk at collection point

1. Purpose

This Work Instruction aims to ensure that the milk delivered by farmers is quality tested by the CBE before it is accepted and bulked. The testing process ascertains that accepted milk passes the laid down quality standards and is bulked according to farmers' payment groups (milk cans). The testing process also ensures that milk that does not meet the required standard is rejected;

2. Scope

Milk acceptance testing at milk collection points (CPs), recording of milk delivery volumes, bulking the received milk according to established farmer payment groups (milk cans) and handing over the received/bulked milk to the CBE.

3. **References**

HC Quality Manual;
CBE Directive DR-001, version 01, dated 27-03-18

4. Definitions of terms

CBE	Cooling and Bulking Enterprises
CP	Milk Collection Point
EAS	East African Standard
HC	Happy Cow Ltd.
KS	Kenya Standards
MQT&T	Milk Quality Tracking & Tracing
QBMPS	Quality-Based Milk Payment System
QC	Quality Controller
RP	Report /Record

5. Description of activities

Farm milk acceptance testing involves the following activities:

a. Loading on the truck/tractor the properly labelled milk cans to be used in milk collection

The Grader (CBE) loads the clean and appropriately labelled aluminium milk cans for the assigned route onto the truck, as per the *Register Farm Group & Milk Can Numbers* (RP -003).

b. Preparing the milk testing equipment

The Grader (CBE) prepares the milk testing equipment as per directive DR-001.

c. Milk acceptance testing

The Grader (CBE) tests milk upon delivery by each farmer at the CP in accordance with the acceptance tests set out in the HC Quality Manual (page 3-10) and the KS/EAS 2007 Kenyan raw milk standards available at the CBE laboratories. Milk that does not conform to these criteria is rejected as per directive DR-001.

d. Milk weighing and recording

The Grader (CBE) weighs the accepted milk using a digital weighing scale and records the volume to one decimal place (e.g. 0.1) in the *Daily Farm Delivery Monthly Journal* (RP 005B) and the *Daily Farm Delivery Monthly Journal – Farmer (carbonated copy)* (RP-005A).

e. Bulking farmers milk

The Grader (CBE) then bulks the milk into the QBMPS 50-litre aluminium milk cans as per RP-003. He/she should apply the guidelines explained in DR-001 in cases where the farmers deliver milk in excess of the 50 litre can capacity.

6 Report and Record templates

RP-003 Register Group & Milk Can Numbers

QUALITY-BASED MILK PAYMENT SYSTEM

CBE Name & Happy Cow

Date: ……
CBE: ……

Can No.	Supply No.	Farmer's Name	Qty (Kgs)

RP-005A: Daily Farm Delivery Monthly Journal – Farmer (carbonated copy)

Milk Collection Route:		**Month/Year:**		
Farmer's Name:				
AM – Kgs	**Member No.**	**PM - Kgs**	**Member No.**	**Date**
				1
				2
				3
				Etc.
Totals –Kgs:				
Amount (Ksh):				

RP-005B: Daily Farm Delivery Monthly Journal – Grader (CBE)

Milk Collection Route:		**Month/Year:**		
Farmer's name:				
AM – Kgs	**Member No.**	**PM - Kgs**	**Member No.**	**Date**
				1
				2
				3
				Etc.
Totals –Kgs:				
Amount (Ksh):				

WI-005: Farm milk transportation

1. Purpose

This Work Instruction (WI) aims to ensure that milk which is collected and bulked (per group) at the milk collection points (CPs) is transported to the CBE reception platform in an orderly manner and within the agreed time schedule, as set out by CBE management.

2. Scope

Transportation of the farm-group bulked milk from the CPs to the CBE reception platform.

3. References

Milk quality policies
DKS 1552: 2015 - Code of hygienic practice for Milk and Milk products.

4. Definitions

CBE	Cooling and Bulking Enterprises
CP	Milk Collection Point
CPO	Collection Points Operator
WI	Work Instruction

5. Description of milk transportation activities

Bulk milk transportation will involve the following activities (please note that this WI does not include maintenance of transporting equipment such as tractors and motorbikes)

a. Adherence to personal hygiene

The Transporter is expected to observe high levels of personal hygiene to avoid contaminating milk in any way (see DR-001)

b. **Register travel time**

The Transporter and Grader (CBE) shall follow the *Time schedule* (RP-005C) as issued and prepared by the MCC.

- The Transporter shall record the departure and arrival times in the morning in the *Transport Time Record* (RP-005C) provided at the gate.
- The transporter shall make stops at every designated CP, enabling the Grader (CBE) to test delivered milk for acceptance.

c. Transporting milk from CPs to the CBE platform

- The Transporter shall adhere to the predetermined route and time schedule for the entire milk collection route as indicated in RP-005C).
- At the conclusion of the milk collection route, the Transporter will transport the bulked milk directly to the CBE platform, avoiding any unnecessary delays.

d. Preventing milk spillage and contamination

- The Milk Transporter shall ensure that milk is not contaminated in transit by driving the truck away from sources of contamination and avoiding unnecessary delays that can lead to milk spoilage (see Directive-001).

e. Cleaning the milk transport vehicle

- The Transporter shall clean the milk transport vehicle on a daily basis immediately after off-loading the milk cans, in readiness for milk collection activities the following day.
- The Transporter shall report to the CBE manager the *Vehicle Repair Request* (RP-027) in case the transportation vehicle needs repair.

6. Report and Record templates

RP- 005C: Transport Time Record (Schedule in milk collection/route, by MCC)

QUALITY-BASED MILK PAYMENT SYSTEM ***CBE Name & Happy Cow***			
S/No.	**Collection route**	**Time taken**	**Approval**

RP-027: Vehicle Repair Request

QUALITY-BASED MILK PAYMENT SYSTEM ***CBE Name & Happy Cow***		
Date	**Vehicle Type & ID Plate No.**	**Description of technical malfunction**
Remarks:		
Approval Manager: **Date signed:**		

WI-006: Milk reception CBE platform (Processor Quality Controller)

1. Purpose

To ensure that all milk that is delivered at the CBE is first tested for quality by the Quality Controller (QC) for the Processor, who is present at the CBE milk reception platform. The objective is to identify milk that meets the Processor's standards for acceptance and to label this accepted milk as "Processor milk" to be transported for processing at Happy Cow.

2. Scope

Milk reception, acceptance testing and handing over milk to the CBE for further processing (cooling).

3. References

HC Quality Manual
HC Directive (DR-002)
CBE Directive (DR-001)

4. Definitions of terms

CBE	Cooling and Bulking Enterprise
HC	Happy Cow Ltd.
LA	Lactic Acid
QC	Quality Controller
RP	Report and Record
RT	Resazurin Test

5. Description of activities

a. Preparing for milk reception at CBE platform

The QC (Processor) based at the CBE platform cleans the reception platform and sanitises the milk collection equipment, including the weighing bowl, muslin cloth, dump tank, milk pump & piping as well as the milk cooling tank.

Preparing the acceptance tests (laboratory equipment)

The QC (Processor) shall prepare the CBE laboratory equipment necessary for conducting the acceptance tests, as set out in the HC Quality Manual (pages 3-10). The tests include';

- Alcohol test
- Resazurin test (10 min)
- Lactic acid test
- Yoghurt test (antibiotic residues)
- Antibiotic test
- Organoleptic test
- Somatic Cell Count

b. Testing milk for acceptance at the CBE platform

Prior to opening, the milk cans that have been received from the Graders (CBE) must first be cleaned with clean cold water to remove the dust on the cans. The QC (Processor) then opens each milk can and carries out the acceptance tests. The QC (Processor) tests all the milk that has been delivered at the CBE Platform. The sampling dipper and stirrer should be cleaned and sanitised as described in HC Directive DR-002.

On a daily basis, the QC (Processor) based at the CBE shall take a milk sample from each QBMPS milk can for further analysis in the lab (see list of tests in b. above). The correct procedure for taking milk samples is described in DR-002.

Milk that does not meet the acceptance criteria will be rejected. The corresponding milk can shall be set aside and handed over to the CBE (see point d. below).

c. Handling rejected milk

If milk samples from a specific can do not meet the acceptance tests, the QC (Processor) shall replace the lids on the rejected milk cans and hand them over to his/her counterpart QC (CBE). The QC (Processor) shall keep the record *Milk Rejects at CBE Platform* (RP-006) and report this to the Project Manager (Processor) by email on a monthly basis.

d. Receiving milk from individual farmers who deliver directly to the CBE

The QC (Processor) is also responsible for testing milk delivered at the CBE platform by individual farmers. The QC (Processor) first establishes a project milk can for farmers under the QBMPS who are delivering their milk directly to the platform. The QC (Processor) records this information in the *Milk Receipt CBE Platform (individual farm delivery at CBE)* (RP-003A) and reports it to the Accounts Clerk (CBE).

Following the acceptance testing, these individual farmers should bulk their milk in the designated milk can(s) for traceability and sampling for bonus payment.

In case milk does not meet the acceptance standards, the milk must be returned to the individual supplier (see DR-001).

e. Milk weighing, bulking and cooling

At the CBE platform, the QC (Processor) shall ensure that the accepted milk is tipped through a sieve into the weighing bowl, weighed and emptied into the dump tank and bulked in the milk cooling tank for cooling awaiting dispatch. The QC (CBE) is responsible for recording and reporting the volumes received by the CBE. The report used is *CBE Daily Milk Dispatch note* (RP-008)

6. Report and Record templates

RP-002 Suppliers List & Volumes Delivered

QUALITY-BASED MILK PAYMENT SYSTEM

CBE Name & Happy Cow

Date: ……

Bonus type: ……. Payment rate: 80%

Can No.	Supply No.	Farmer's Name	Qty (Kgs)	Amount

RP-006 Milk Rejection Record CBE Platform (monthly) CBE Name:

		Rejection reasons based on the tests carried out					
Date	**Milk Can ID Type (plastic)**	**Organoleptic**	**Alcohol**	**Density**	**L. A %**	**10 Min R.T**	**Qty (Kgs)**

WI-007: Milk reception at CBE platform (CBE Quality Controller)

1. Purpose

The objective of this Work Instruction (WI) is to ensure that all milk delivered to the CBE platform is subjected to acceptance testing. This includes "Project Milk," which is received by the Quality Controller (QC) representing the Processor at the CBE, and "Non Project Milk" that does not meet the QBMPS standards and is received by the QC (CBE). It must be noted that the QC (Processor) based at the CBE acts in name of the Processor to test project milk on acceptance but does not register milk volumes. It is the responsibility of the QC (CBE) to register the volumes of project milk that is received (accepted) by the QC (Processor). The QC (CBE) also carries out acceptance testing and registering of milk volumes delivered by non-project parties (individual farmers and graders).

2. Scope

Milk reception at CBE platform.

3. References

CBE Directive (DR-001)

4. Definitions of terms

CBE	Cooling and Bulking Enterprise
HC	Happy Cow Ltd.
QC	Quality Controller
RP	Report and Record
WI	Work Instruction

5. Description of activities

a) Accepting milk from individual farmers delivering directly to the CBE

Farmers who deliver directly to the cooling plant (CBE) should be treated in the same way as farmers who deliver their milk to the milk collection point. Provided that these farmers are included in the project list, *Register Milk and Group Can Numbers* (RP-003), the QC (Processor) tests the milk delivered by the farmers on acceptance. In turn, the QC (CBE) weighs and records the milk volumes in the *Daily Farm Delivery Monthly Journal - Grader* (RP-005B) with a carbon copy, *Daily Farm Delivery Monthly Journal - Farmer* (RP-005A). RP-005B is forwarded to the CBE reception clerk after milk reception is completed, while RP-005A remains with the farmer as prove of milk delivery. The report format is included under WI-002.

b) Controlling weight differences

The QC (CBE) is responsible for confirming the quantities delivered by the Graders, as well as the quantities indicated in the *Daily Farm Delivery Monthly Journal* (RP-005B) at the farm level, along the collection routes. Any differences observed after weighing the quantities delivered by the Graders should be agreed and affirmed by use of a signature from both parties as per the *Weight Difference Report* (RP-017).

c) Rejecting milk deliveries

Milk that has been delivered by individual farmers at the CBE that is rejected by the QC (Processor) and is returned to the respective farmers by the QC (CBE). Rejected bulked milk that has been collected along the milk collection route by the Grader/Transporter is bulked separately by the QC (CBE) for sending to alternative markets. The volumes of rejected milk from individual farmers are not recorded.

d) Cleaning CBE milk reception platform after activities.

Both QCs (CBE and Processor) should assist in maintaining cleanliness at the CBE platform before and after milk reception. The relevant activities include, cleaning the dump tank, piping, cooling tank, muslin cloth and the platform itself (See DR-001).

e) Handing over received milk to the Quality Controller (CBE)

The QC (CBE) shall ensure that the accepted milk is tipped through a sieve into the weighing bowl, weighed, recorded in the RP-003, emptied into the dump tank and bulked in the milk cooling tank to await dispatch to the Processor. The QC (CBE) receives milk from the QC (Processor) in record RP-007 and reports these to the CBE Manager.

f) Dispatching Milk to the processor.

The QC (CBE) is responsible for milk dispatch at the CBE. The *Delivery Note* (RP-008) should be signed by the CBE QC, Processor QC and the truck driver[6].

6. Reports and Record templates

RP-007: Milk Receipt CBE **CBE Name:**

Date	Quantity (Kgs)	Name Grader / Transporter	Name QC (CBE)	Signature Grader / Transporter	Signature QC (CBE)

RP-003A: Milk Receipt CBE Platform (individual farm delivery at CBE) **CBE Name:**

Date	Quantity (Kgs)	Name/Signature QC (Processor)	Name/Signature QC (CBE)

RP-008 Daily CBE Milk Dispatch

CBE IDENTIFICATION

DELIVERY NOTE

Date: ……

Processor name: ……

Oder No: …….. **Invoice No: ……..**

Quantity	Particulars
	description of the milk condition and quality aspects

Above goods received in good order and condition

Issued by (on behalf of CBE): …… Signature: ……

Received by (on behalf of the Processor): …… Signature: ……

[6] Milk temperatures at the point of receipt and delivery are an important control parameter and can be included in the reports

RP-017: Weight Difference Report (CBE Clerk) **CBE Name:**

Date	Raw milk quantity (Kgs)			Grader Signature	Signature QC	Remarks
	Grader Journal RP-001B	Actual received	Differences			

WI-008: CBE Milk Dispatch + CIP (Processor)

1. **Purpose**
The purpose of this Work Instruction (WI) is to ensure that milk that is offered by a CBE for collection is correctly handed over to a representative of the Processor who is responsible for the collection and transportation of the milk. This WI also describes the correct milk dispatch process from the CBE to the Processor, indicating relevant quality criteria.

2. **Scope**
Dispatching of cooled milk from the CBE Bulk Cooling Tank to the Processor's Bulk Tanker.

3. **References**
HC directive (DR002)
CBE directive (DR-001)

4. **Definition of terms**

CBE	Cooling and Bulking Enterprise
CIP	Cleaning in Place
HC	Happy Cow Ltd.
QC	Quality Controller
WI	Work Instruction

5. Description of activities

a. Tanker arrival at the CBE
The tanker driver arrives at the CBE and packs the tanker near the dispatch area. In case the milk has not attained the required temperatures (4^0C), the Bulk Tanker Driver waits for the milk to chill sufficiently before loading.

b. Transfer of milk from the CBE cooling tank to the Processor's bulk tanker

i. **Cleaning and connecting the milk pipe to the milk cooler:** The QC (CBE) cleans and connects the milk pipe to the milk cooler once the milk in the cooler attains a temperature of 4^oC and below.

ii. **Connecting the milk pipe to the bulk milk tanker and pumping milk into the tanker:**

iii. **Transferring milk from the milk cooler to the bulk milk tanker:** The QC (CBE) transfers the milk volume authorised by the CBE management from the milk cooler to the bulk tanker.

c. Confirmation of the milk transferred into the bulk tanker
The Bulk Tanker Driver and the QC (CBE) confirm the volume of milk transferred into the bulk milk tanker using a dip stick and compare it with the milk volume removed from the milk cooler.

d. **Preparation of milk dispatch note and CBE Daily Milk Dispatch Report**
The QC (CBE) prepares a *Bulk Tanker Dispatch Note (*RP-008A) indicating the volume and quality of milk loaded into the bulk tanker. A related form, the *Daily CBE Milk Dispatch*

(RP-008) is countersigned by the QC (Processor) and the Bulk Tanker Driver and a copy is issued to the driver. The Bulk Tanker Driver signs the dispatch/receipt note (RP-008A) to the QC (CBE), with a copy for the processor, indicating the volume and quality of milk received.

e. CIP cleaning for the milk cooler

The QC (Processor) and the QC (CBE) jointly clean the milk cooler using the CIP solutions provided, immediately after off-loading milk from the milk cooler.

6. **Report and Record templates**

RP-008 Daily CBE Milk Dispatch

CBE IDENTIFICATION **DELIVERY NOTE** **Date: ……** **Processor name: ……** **Oder No: ……..** **Invoice No: ……..**	
Quantity	**Particulars**
	description of the milk condition and quality aspects
Above goods received in good order and condition Issued by (on behalf of CBE): …… Signature: …… Received by (on behalf of the Processor): …… Signature: ……	

RP-008A Bulk Tanker Dispatch Note

PROCESSOR IDENTIFICATIION **(logo/Name)** **CBE name: ……..** **Date: ……**	
Quantity	**Particulars**
	Description of the milk condition and quality aspects
Rejected Kgs: …….. Reason(s) for rejection: …… Checked by: …… Signature: …….. Authorised by: …….. Signature: ……	

WI-009: Bulk milk transport (Processor)

1. Purpose

This Work Instruction is designed to ensure that cooled bulk milk is transported in a hygienic way from a CBE milk cooler to the processing factory at Happy Cow Ltd. within the stipulated time schedule.

2. Scope

Milk dispatch at the CBE followed by handing over the cooled milk to the Bulk Tanker Driver (Processor); loading the cooled milk from the CBE milk cooler to the bulk transport tanker of the Processor (Happy Cow); Transportation from the CBE to the Processor and handing over the transported milk (Driver) to the Processor (QC Processor). Also includes instructions for cleaning the interior and exterior of the bulk tanker.

3. References

Processor directives (DR-002)

4. Definitions of terms

BTD	Bulk Tanker Driver (Processor)
CBE	Cooling and Bulking Enterprise
CIP	Cleaning In Place
QC	Quality Controller

5. Description of activities

a. Time recording

The Bulk Tanker Driver (BTD) shall clock out during departure from Happy Cow and clock in upon arrival at the CBE to determine the total time spent on the journey.

b. **Milk dispatch**

i. Upon arrival at the CBE the BTD shall report to the CBE Manager.
ii. The BTD shall indicate the compartment into which the milk should be loaded, and confirm the quality parameters (e.g. required temperature) before the milk is pumped into the tanker.
iii. The QBMPS milk should be bulked into a separate compartment of the tanker and this information should be recorded in *Register Number of Milk cans* (RP-004). This information shall guide the QC (Processor platform) during offloading.

c. Transporting milk from the CBE to the Processor

i. Once the "Dispatch note" is signed off, the BTD shall tightly seal the milk tanker compartments before starting the return journey to prevent milk spillage in transit;
ii. The BTD shall depart for the HC processing factory without any delay.

d. Off-loading milk at Happy Cow's processor platform

i. Upon arrival at the Processor, the BTD shall report to the QC (Processor) and immediately handover the *Bulk Tanker Dispatch Note* (RP-008A) and the *Daily CBE Milk Dispatch Report* (RP-008) for analysis and off-loading.
ii. The QC (Processor) shall record the time of arrival of the bulk tanker as well as volume of milk received in RP-008A.

iii. The QC (Processor) shall handover both RP-008 and RP-008A to the Milk Production/Quality Manager who is responsible for monitoring the performance of BTDs.

e. Reception and delivery of milk samples to/from CBE to Processor in a cool box
See WI-011A

f. Cleaning the bulk milk tanker
The QC (Processor platform) shall perform a full CIP of the interior of the bulk milk tanker immediately after offloading the milk as per HP DR-002. The BTD shall then clean the exterior surfaces of the tanker at the designated place, as soon as possible following the CIP.

6. Report and Record templates

RP-023 Time Record Sheet / clocking card

QUALITY-BASED MILK PAYMENT SYSTEM
CBE Name & Happy Cow

Date	Vehicle no.	Name	Route	Time out	Time in	Signature	Security	Remarks

RP-004 Register Number of Milk Cans
RP-004 is usually shared with the CBEs to notify them of an email containing the QBMPS reports, with some comments on the cans to be awarded a bonus. At the time of preparing this manual there was no format available for this form.

RP-008 CBE Daily Milk Dispatch

CBE NAME / IDENTIFICATION

DELIVERY NOTE
Date: ……
Processor name: ……
Oder No: …….. **Invoice No: ……..**

Quantity	Particulars
	description of the milk condition and quality aspects

Above goods received in good order and condition

Issued by (on behalf of CBE): …… Signature: ……

Received by (on behalf of Processor): …… Signature: ……

RP-008A Bulk Tanker Dispatch Note

PROCESSOR NAME / IDENTIFICATIION **(logo/Name)** **CBE name: ……..** **Date: ……**	
Quantity	**Particulars**
	Description of the milk condition and quality aspects
Rejected Kgs: …….. Reason(s) for rejection: …… Checked by: ……. Signature: …….. Authorised by: …….. Signature: ……	

WI-010: Milk reception, Processor Platform

1. Purpose

This Work Instruction provides guidelines for the reception of milk that is delivered at the Processor platform by tanker, as well as individual deliveries by tanker. It provides an overview of activities that are required at the reception platform to check and monitor the volumes as well as quality of milk, including the collection of milk samples for quality analysis at the laboratory.

2. Scope

Milk reception at the Processor platform.

3. References

HC Quality Manual
Project CBE partner minutes 04/07/2016
Equipment manuals file (HCL/QP/09)

4. Definition of terms

CBE	Cooling and Bulking Enterprise
EAS	East Africa Standard
KS	Kenya Standard
QC	Quality Controller
RP	Report and Record

5. Description of activities

a. Cleaning the reception platform and milk reception equipment

b. Preparing milk testing reagents and equipment

The QC (Processor platform) prepares the milk testing equipment – such as lactometers, measuring cylinders, alcohol guns and ethanol solution – that are needed during milk acceptance testing.

c. Conducting milk acceptance testing

The QC (Processor platform) takes samples of milk from the bulk tanker for acceptance tests (including organoleptic, density and alcohol tests) as set out in the HP Quality Manual (pages 3-10) and the KS/EAS 2007 standards.

d. Recording and reporting

The QC (Processor platform) records the results of the milk tests in the *Daily Platform Analysis Form* (RP-014) and shares it with the Processor's Quality Assurance Manager, Production Manager and Project Manager.

For more details, see HC Directive (DR-001)

6. Report and Record templates

RP-014 Daily Platform Analysis Form (Processor platform)

QC 1 (a) CERTIFICATE													DATE.....	
SUPPLIER'S NAME / CODE	Quantity (Kgs)	Organoleptic	Alcohol	Freezing Point	10 Min. RT	% LA	LACTO	% BF	% TS	%SNF	Sensitivity	Antibiotic	Rejection (Kgs)	Reason Rejection

WI-011A: Processor Milk Sample Handling

(see Quality Control Flow Chart)

1. Purpose

This Work Instruction is intended to detail how the QBMPS milk samples should be collected and handled, starting with the preparation of sample bottles at the Happy Cow Laboratory.

2. Scope

Determining the number of QBMPS samples to be taken per sampling session, developing a daily sample analysis register, and autoclaving and labelling the sample bottles.

3. References

Processor Directive (DR-002)
Happy Cow Quality Manual

4. Definition of Terms

CBE	Cooling and Bulking Enterprise
HC	Happy Cow
MCC	Milk Chain Coordinator
QBMPS	Quality-Based Milk Payment System
QC	Quality Controller

5. Description of activities

a. Confirming the active QBMPS project milk cans at the CBE

The QC/Lab Technician (Processor) shall confirm the active QBMPS project milk cans from the QC Processor based at the CBE platform so as to determine the number of sample bottles to prepare. He/she does this by writing an email to the QC Processor at the CBE and copying the CBE Manager, the Project Manager and the MCC.

b. Cleaning the Sampling bottles

The Processor QC/Lab Technician shall clean the sample bottles properly as detailed in the SOP (HCL/QP/09/BC) and as provided in the Processor Directives (DR-002).

c. Sterilising the sample bottles

The Processor QC/Lab Technician shall sterilise the sample bottles by filling them with de-ionised water and placing them in an autoclave for sterilisation as set out in the Processor Directives (DR-002).

d. Labelling the Sample bottles

The Processor QC/Lab Technician shall then label the sample bottles after sterilisation. He will randomly label them based on the active project milk cans. However, no project milk can shall be sampled and/or analysed twice in a specific sampling session.

e. Compiling the Daily CBE Sample Analysis Register

The Processor QC/Lab Technician shall compile a *Daily Sample Analysis Register* (RP-010) of the labelled sample bottles so as to keep track of the sample bottles released to the field and keep track of their return from the CBEs.

f. Dispatching the sample bottles to the CBEs

The Processor QC/Lab Technician shall dispatch the labelled sample bottles to the Processor QC (CBE) through the bulk milk tanker in readiness for sampling from the project milk cans by the Processor QC (CBE);

6. Report- and record-template

RP - 010 Daily Sample Analysis Register (Sampling schedule)

QUALITY-BASED MILK PAYMENT SYSTEM ***CBE Name & Happy Cow***				
Date	**CBE**	**Can no.**	**Sampling session**	**QC in charge**

WI-011B: Processor Milk Sample Taking

(see Quality Control Flow Chart)

1. Purpose

This Work Instruction describes how milk samples should be taken from the bulk milk tanker once it arrives at the Processor platform as part of quality control milk samples.

2. Scope

It describes milk sampling at the processor platform from the milk tanker into the labelled sampling bottles, keeping the milk samples cool and analysing them for quality control at the Happy Cow Ltd laboratory.

3. References

- AOAC (International Standards) Procedures
- Processor Directives (DR-002)
- Happy Cow Quality Control manual

4. Definition of terms

CBE	Cooling and Bulking Enterprise
QBMPS	Quality-Based Milk Payment System
QC	Quality Control

5. Description of activities

a. Preparation of the sampling equipment

The Processor QC/Lab technician shall bring the labelled sampling bottles, and sampling dipper to the processor platform once the bulk milk tanker arrives in preparation for sampling.

b. Sample taking from the bulk milk tanker

The Processor QC/Lab technician shall take the bulk tanker milk samples per compartment. The Processor QC/lab technician must observe sterility when sampling by sanitising his/her hands, using a sterile sampling dipper and replacing the lids of the sample bottles immediately after putting milk into the sample bottles. The Processor QC/Lab technician shall sample milk as set out in the sampling procedure (HCL/QP/10/SP). See Directive DR-002.

c. Storage of the bulk tanker milk samples

The Processor QC/Lab technician shall keep the bulk tanker milk samples in a fridge to keep them chilled at a temperature of below 4^{o}C. This inhibits bacterial multiplication in the milk samples and assures credible results after analysis.

d. Filling of the sample submission form

The Processor QC/Lab technician shall fill the sample submission form after collecting milk samples from the bulk tanker and securing them in an ice box. The is to keep stock of all the milk samples received and ensure recording of the time they were received at the laboratory.

6. Report- and record-templates

No reports (See DR-002 for forms used)

WI-011C: Processor Milk Sample Analysis

(see Quality Control Flow Chart)

1. Purpose

This Work Instruction describes the milk sampling procedure for bulk deliveries and the farmer groups attached to each 50 litre milk can. It also describes how the quality analysis results are recorded and reported to facilitate milk payments.

2. Scope

The preparation of milk samples, the quality analysis and reporting procedure.

3. References

- ISO/IEC 17025 standard records and procedures
- Processor directives (DR-002)

4. Definition of terms

CBE	Cooling and Bulking Enterprises
HC	Happy Cow ltd.
MCC	Milk Chain Coordinator
QBMPS	Quality-Based Milk Payment System
QC	Quality Control
QP	Quality Procedure
RP	Report
WI	Work Instructions

5. Description of activities

a. Preparation of the sampling schedule per sampling session as per the *Daily Sample Analysis Register* (RP-010). This schedule should be as random as possible and should be shared with the quality manager at HC and the project manager only.

b. Preparation of the sampling bottle as per HC directive while labelling should be as per the sampling schedule prepared in 5a above.

c. Coordination of the sampling process with the Project team (QC and MCC) at the CBEs, including passing labelled sampling bottles to them.

d. Collection of tanker samples at the processor platform as per the sampling protocol provided (HCL/QP/10/SP).

e. Analysis of QBMPS samples including the bulk tanker sample as per HC directive.

f. Reporting the quality analysis reports to the project manager on time via email. These includes *Laboratory Report* (RP-011A) and *QBMPS Report* (RP-012A) as generated from the QBMPS software in both PDF and CSV files formats.

6. Report- and Record-templates

RP-010 Daily Sample Analysis Register

QUALITY-BASED MILK PAYMENT SYSTEM
CBE Name & Happy Cow

Date	CBE	Can no.	Sampling session	QC in charge

RP-011: Laboratory Report

QUALITY BASED MILK PAYMENT SYSTEM
CBE Name & Happy Cow

Report serial number:

Addresses (Processor and CBE):

Time period of the report/month:

S/NO	Sample ID	TBC cfu/ml results	Total Solids results	Freezing point depression results	Z- value results	Remarks

Foot notes: QBMPS standard, KEBS standards, Grading system, parameters applied a quality statement and signatories.

RP-011B: QBMPS Report

QUALITY BASED MILK PAYMENT SYSTEM

CBE Name & Happy Cow

Report serial number:

Addresses (Processor and CBE) :

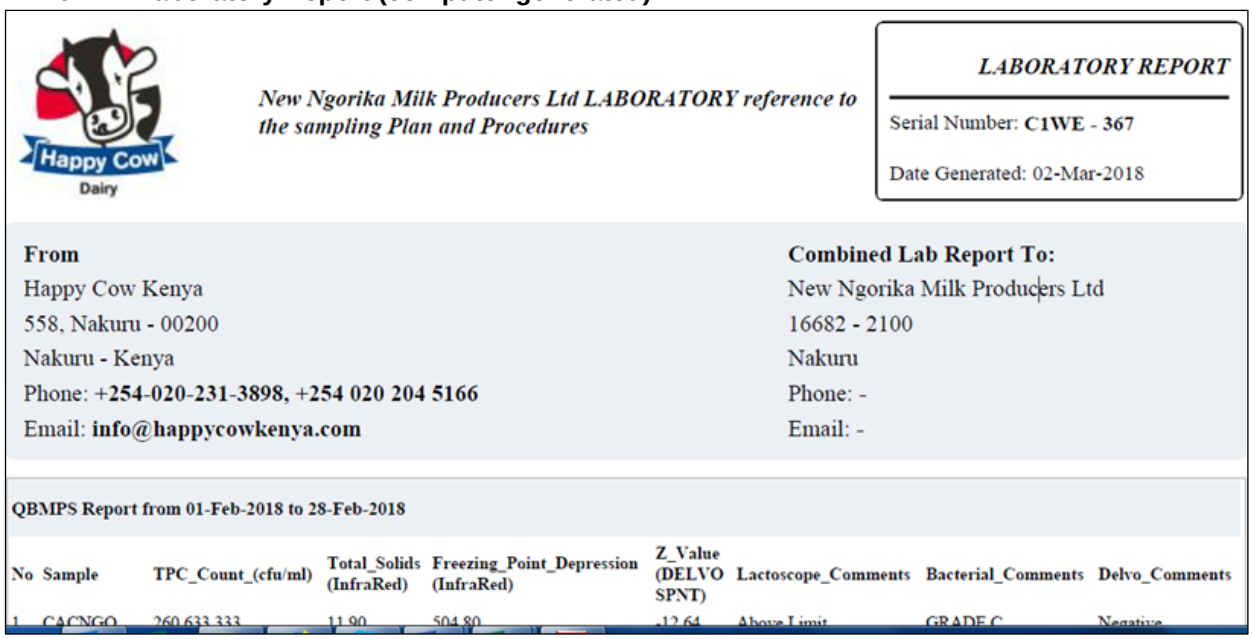
Time period of the report/month :

S/NO	Sample ID	TBC cfu/ml	TBC score	Total Solids score	Freezing point depression score	Z-value score	% Total score	Remarks

Foot notes: QBMPS standard, KEBS standards, Grading system, parameters applied a quality statement and signatories

Additional (real time) examples

RP-011A: Laboratory Report (computer generated)



New Ngorika Milk Producers Ltd LABORATORY reference to the sampling Plan and Procedures

LABORATORY REPORT

Serial Number: **C1WE - 367**

Date Generated: 02-Mar-2018

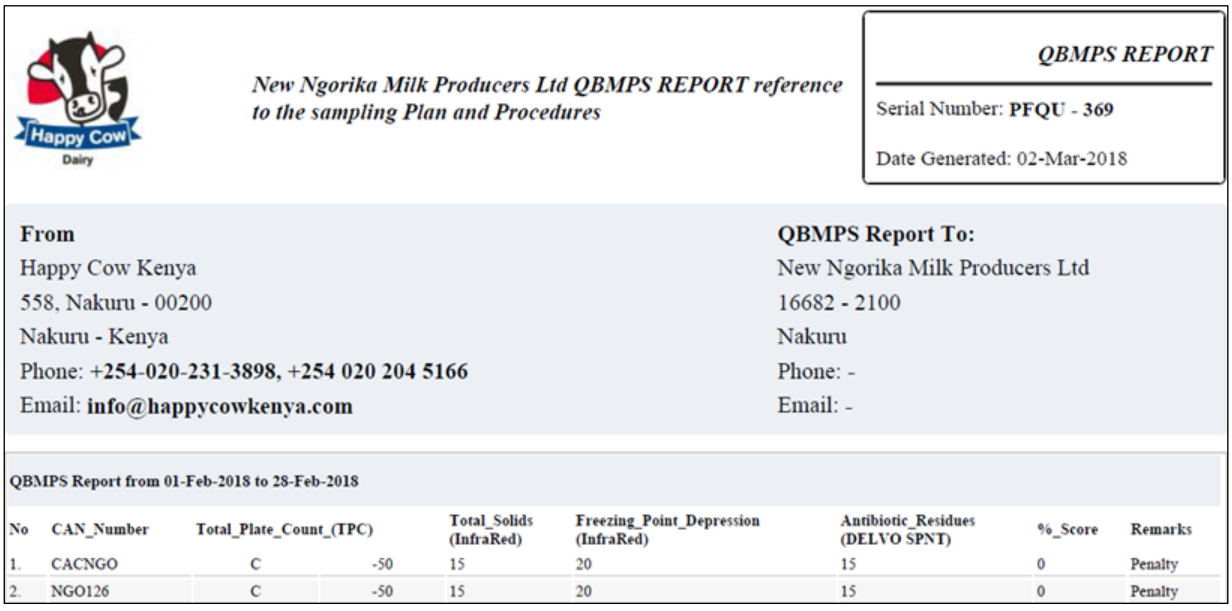
From
Happy Cow Kenya
558, Nakuru - 00200
Nakuru - Kenya
Phone: **+254-020-231-3898, +254 020 204 5166**
Email: **info@happycowkenya.com**

Combined Lab Report To:
New Ngorika Milk Producers Ltd
16682 - 2100
Nakuru
Phone: -
Email: -

QBMPS Report from 01-Feb-2018 to 28-Feb-2018

No	Sample	TPC_Count_(cfu/ml)	Total_Solids (InfraRed)	Freezing_Point_Depression (InfraRed)	Z_Value (DELVO SPNT)	Lactoscope_Comments	Bacterial_Comments	Delvo_Comments
1	CACNGO	260,633,333	11.90	504.80	-12.64	Above Limit	GRADE C	Negative

RP-012A: QBMPS Report (computer generated)



New Ngorika Milk Producers Ltd QBMPS REPORT reference to the sampling Plan and Procedures

QBMPS REPORT

Serial Number: **PFQU - 369**

Date Generated: 02-Mar-2018

From
Happy Cow Kenya
558, Nakuru - 00200
Nakuru - Kenya
Phone: **+254-020-231-3898, +254 020 204 5166**
Email: **info@happycowkenya.com**

QBMPS Report To:
New Ngorika Milk Producers Ltd
16682 - 2100
Nakuru
Phone: -
Email: -

QBMPS Report from 01-Feb-2018 to 28-Feb-2018

No	CAN_Number	Total_Plate_Count_(TPC)		Total_Solids (InfraRed)	Freezing_Point_Depression (InfraRed)	Antibiotic_Residues (DELVO SPNT)	%_Score	Remarks
1.	CACNGO	C	-50	15	20	15	0	Penalty
2.	NGO126	C	-50	15	20	15	0	Penalty

WI-012A: CBE Milk Sample Taking

(see Quality Control Flow Chart)

1. Purpose

The Work Instruction is intended to give guidance on the proper steps to follow while taking the QBMPS milk samples from the project milk cans, the milk cooler and the bulk milk cooler.

2. Scope

It involves receiving the sample bottles from the bulk tanker driver, sample taking, sample cooling in the ice box and handing over the milk samples to the bulk milk tanker driver to deliver them to the QC Processor/Lab Technician.

3. References

- Happy Cow Milk Quality manual.

4. Definition of terms

QBMPS	Quality-Based Milk Payment System
CBE	Cooling and Bulking Enterprises
QC	Quality Controller

5. Description of activities

a. Receiving sample bottles from the bulk milk tanker driver

The QC Processor (CBE) shall receive the ice box containing the sample bottles from the Bulk Tanker Driver in readiness for milk sampling the following day.

b. Taking milk samples from the QBMPS project milk cans

- The QC Processor (CBE) takes the QBMPS milk samples from the project milk cans as labelled on sampling bottles.
- The Processor QC (CBE) empties the water in the sterile sampling bottle one at a time and immediately fills the labelled sample bottle with milk sampled from the corresponding project milk can.
- The Processor QC (CBE) must use a sterile sampling dipper, stirrer and must sanitise the hands to ensure no bacteria are added into the milk sample from outside sources.
- The Processor QC (CBE) shall also take a milk sample from the milk cooler.

c. Cooling the QBMPS milk samples in the ice box

The QC Processor (CBE) shall immediately place each filled sample bottle into the ice box which shall have cooling elements placed in ice/chilled water for fast cooling of the milk samples to below 4^{o}C to inhibit bacterial multiplication which would give inaccurate results.

d. Dispatching the QBMPS milk samples to Happy Cow Ltd

The QC Processor (CBE) shall properly seal the ice box holding the QBMPS project milk samples and hand it over to the bulk milk tanker driver who will deliver it to the Processor QC/Lab Technician at Happy Cow Ltd for analysis.

6. Report- and Record-templates

None.

WI-012B: CBE Milk Sample Analysis

(see Quality Control Flow Chart)

1. **Purpose**

   This Work Instruction is meant to guide the analysis of the QBMPS milk samples in the laboratory of the partner CBEs as part of quality control of the QBMPS project milk cans.

2. **Scope**

   It entails labelling the sampling containers, milk sample taking, proper cool storage at below 4^{o}C, sample analysis, results recording and reporting to the Project Manager.

3. **References**

   Happy Cow Milk Quality manual

4. **Definition of terms**

CBE	Cooling and Bulking Enterprises
QBMPS	Quality-Based Milk Payment System
QC	Quality Control

5. **Description of activities**

   a. Sample taking from the QBMPS project milk cans

   The Processor QC (CBE) takes milk samples daily from each active QBMPS project milk can in the CBE. The Project QC (CBE) sterilises his hands and uses a sterile stirrer and sampling dipper to sample milk from each project milk can into the sampling container Happy Cow Ltd as per DR-002.

   b. Cold storage of the QBMPS milk samples

   The Processor QC (CBE) stores the milk samples at a temperature of below 4^{o}C before analysis starts to inhibit bacterial multiplication in the sample which would give wrong analysis results; The QBMPS milk samples are stored in the Laboratory refrigerator.

   c. Sample analysis

   The Processor QC (CBE) shall open each QBMPS milk can and carry out the organoleptic tests, the density test, the peroxide test and the alcohol test on a daily basis as set out in the Happy Cow Ltd quality manual for each can under the project route.

   The Processor QC (CBE) shall also analyse the milk samples taken earlier from each QBMPS project milk cans and stored in the refrigerator for lactic acid, antibiotic residue test, 10 minute Resazurin test, Somatic Cell Count and the yoghurt test as set out in the Happy Cow Ltd Quality Manual for each milk can under the project route.

   d. Analysis results recording and reporting

   The Processor QC (CBE) compiles the *CBE Monthly Analysis Report* (RP-012A/B) at the end of the month based on the *CBE Daily Analysis Report* (RP-013) and sends it to the Project Manager.

6. **Reporting templates**

   See next page.

RP-013: CBE Daily Analysis Report (field record)

QUALITY-BASED MILK PAYMENT SYSTEM ***CBE Name & Happy Cow***											
Date	**Time**	**Can no.**	**Can type**	**Organ ol. test**	**Alcoh ol test**	**Densi ty test**	**H_2O_2**	**L.A. %**	**10 min RT**	**Activi ty test**	**Grader**

RP-012B: CBE Monthly Analysis Report (field record)

QUALITY-BASED MILK PAYMENT SYSTEM ***CBE Name & Happy Cow***											
Date	**Time**	**Can no.**	**Can type**	**Organ ol. test**	**Alcoh ol test**	**Densit y test**	**H_2O_2**	**L.A. %**	**10 min RT**	**Activit y test**	**Grader**

WI-013: Reporting QC Processor

1. Purpose

This Work Instruction aims to ensure that milk sample analysis results are properly documented and reported for milk and bonus payment purposes. The milk payments to farmers are generally based on the volumes that are registered once farmers deliver their milk. However, an additional bonus payment depends on the quality of milk delivered by groups of farmers (milk cans), which are analysed only periodically (twice a month). These results are in turn compared to milk quality analysis results that are obtain from daily milk acceptance testing at the milk collection points. Proper documenting and reporting of these different data is therefore crucial to maintain the integrity of the milk payment & bonus payment system.

1. Scope

This WI covers the collection of data (milk quality analysis results) of milk samples that are collected at both CBEs. This data is captured in records and reported for the purpose of milk payment (calculations).

2. References

Raw cow milk specification (EAS KS 2007)
Happy Cow Milk Quality Manual

3. Definition of terms

CBE	Cooling and Bulking Enterprises
EAS	East African Standard
HC	Happy Cow Ltd.
QBMPS	Quality-Based Milk Payment System
RP	Report

4. Description of activities

a. Record and Report Milk Analysis Results

- Record the analysis results manually as per *Daily Platform Analysis Form* (RP-009).
- Transfer this information in the computer excel sheet and generate *Monthly Platform Analysis Form* (RP-015) every day and monthly.

b. Report

The QC/Lab Technician records, using the *Bulk Tanker Dispatch Note* (RP-008A), all the volumes received at the processor platform as well as the raw milk analysis results in *Daily Platform Analysis Form* (RP-009). He/she reports to the QC manager and finance manager on a daily basis and the end of the month as per *Monthly Platform Analysis Form* RP-015 (ror payment of bulk milk reception).

c. Process milk quality analysis results

Analysis of QBMPS samples, computation of the raw data as per QBMPS software and generate of reports including *QBMPS Report* (RP-012A) and *Laboratory Report* (RP-011) as per QBMPs software.

d. Reporting process

The reports, RP-011, RP-012A and RP-015 are sent by email to the Dairy Operations Manager, Director Processor, Processor QA Manager and Processor Finance manager. This should be completed before 5th of the following month.

5. Report- and Record-templates

RP-009 Daily Platform Analysis Report (recording form at lab.)

See WI 010

RP-011A Laboratory Report (computer generated)

New Ngorika Milk Producers Ltd LABORATORY reference to the sampling Plan and Procedures

LABORATORY REPORT

Serial Number: **C1WE - 367**

Date Generated: 02-Mar-2018

From
Happy Cow Kenya
558, Nakuru - 00200
Nakuru - Kenya
Phone: **+254-020-231-3898, +254 020 204 5166**
Email: **info@happycowkenya.com**

Combined Lab Report To:
New Ngorika Milk Producers Ltd
16682 - 2100
Nakuru
Phone: -
Email: -

QBMPS Report from 01-Feb-2018 to 28-Feb-2018

No	Sample	TPC_Count_(cfu/ml)	Total_Solids (InfraRed)	Freezing_Point_Depression (InfraRed)	Z_Value (DELVO SPNT)	Lactoscope_Comments	Bacterial_Comments	Delvo_Comments
1.	CACNGO	260,633,333	11.90	504.80	-12.64	Above Limit	GRADE C	Negative

RP-012A QBMPS Report (computer generated)

New Ngorika Milk Producers Ltd QBMPS REPORT reference to the sampling Plan and Procedures

QBMPS REPORT

Serial Number: **PFQU - 369**

Date Generated: 02-Mar-2018

From
Happy Cow Kenya
558, Nakuru - 00200
Nakuru - Kenya
Phone: **+254-020-231-3898, +254 020 204 5166**
Email: **info@happycowkenya.com**

QBMPS Report To:
New Ngorika Milk Producers Ltd
16682 - 2100
Nakuru
Phone: -
Email: -

QBMPS Report from 01-Feb-2018 to 28-Feb-2018

No	CAN_Number	Total_Plate_Count_(TPC)		Total_Solids (InfraRed)	Freezing_Point_Depression (InfraRed)	Antibiotic_Residues (DELVO SPNT)	%_Score	Remarks
1.	CACNGO	C	-50	15	20	15	0	Penalty
2.	NGO126	C	-50	15	20	15	0	Penalty

RP-015 Monthly platform analysis report (also used for daily recording RP-009)

Supplier's Name								
Qty (kgs)	%BF	RT	%LA	DENSITY	SNF	TOTALSOLIDS	Anti-Biotic	REJECTED

WI-014: Reporting Bonus Payment (by PM)

1. Purpose

This Work Instruction provides guidelines for the CBEs (QBMPS partners) on how to prepare the list of farmers who bulk their milk into the qualified project milk cans (RP-022). This is a prerequisite for the farmers to be applicable for a bonus payment.

2. Scope

It involves going through the Laboratory, QBMPS, and CBE monthly reports and listing the project milk cans qualifying for bonus awards, based on the results of the QBMPS samples collected twice per month and on all the acceptance tests carried out daily.

3. References

- Project implementation (Proposal) plan
- HC Directive (DR-002)
- CBE directive (DR-001)

4. Definition of terms

CBE	Cooling and Bulking Enterprises;
PM	Project Manager
QC	Quality Controller
QBMPS	Quality-Based Milk Payment System;

5. **Description of activities**

Identify which milk cans meet the criteria for bonus payment

i. Cross-check both Laboratory and QBMPS reports to identify the qualifying project milk cans:

The Project Manager confirms whether both the *Lab Report* (RP-011) *and QBMPS Report* (RP-011A and B) shows the same results for the project milk cans that have qualified for bonus based on the analysis of the QBMPS milk samples collected twice per month.

The milk cans that qualify for bonus as shown in the *QBMPS Report* (RP-011A) cross checked against the Processor QC at *CBE Monthly Analysis Results* report (RP-019).

ii. Cross-check the qualifying project milk cans against the Processor QC at CBE Monthly Analysis results (RP-019)

The Project Manager cross-checks the list (RP-011A) of qualifying project cans against the monthly report from the Processor QC (CBE) (RP-010) to confirm if every QBMPS qualifying project milk can also qualifies for all the acceptance tests on every day of the month. If a qualifying project milk can has failed any of the acceptance tests (see Directive DR-001) it is disqualified from bonus payment and this is communicated to the CBEs.

iii. Report results to the CBE's (partners) on the qualifying milk cans

The Project Manager communicates (results of a. and b.) to the CBEs by sending both the *Laboratory & QBMPS reports* (RP-011 and RP-012). They are also instructed via email on which qualifying project milk cans should be disqualified from bonus payment for failing any acceptance test during the month, as reported in the *CBE Monthly Analysis Results* (RP-019).

b. Approve the QBMPS Bonus Report

The PM Approves the *QBMPS Bonus Report CBE* RP-022 as prepared by the CBE Accounts Clerk before bonus payment is done.

6. Reporting templates

RP-011B: Laboratory Report

QUALITY-BASED MILK PAYMENT SYSTEM

CBE Name & Happy Cow

Addresses (Processor and CBE)……
Time period of the report/month…… **Report serial number**

S/NO	Sample ID	TBC cfu/ml results	Total Solids results	Freezing point depression results	Z-value results	Remarks

Foot notes: QBMPS standard, KEBS standards, Grading system, parameters applied a quality statement and signatories.

RP-012B QBMPS Report

QUALITY-BASED MILK PAYMENT SYSTEM

CBE Name & Happy Cow

Addresses (Processor and CBE)
Time period of the report/month **Report serial number**

S/NO	Sample ID	TBC cfu/ml	TBC score	Total Solids score	Freezing point depression score	Z-value score	% Total score	Remarks

Foot notes: QBMPS standard, KEBS standards, Grading system, parameters applied a quality statement and signatories

RP-019 CBE Monthly Analysis Results (QC Processor)

QUALITY-BASED MILK PAYMENT SYSTEM
CBE Name & Happy Cow

Date	Time	Can no.	Can type	Organol. test	Alcohol test	Density test	H_2O_2	L.A. %	10 min RT	Activity test	Grader

RP-022 QBMPS Bonus Report CBE

QUALITY-BASED MILK PAYMENT SYSTEM
CBE Name & Happy Cow
Date: ……
Bonus type: ……. **Payment rate: 80%**

Can no.	Supply no.	Farmer's name	Qty (Kgs)	Amount

Approval: *Name, Function, Date*

MP/WI-015/A: Calculating Bonus Payments CBE / Cross checks

1. Purpose

This Work Instruction explains how the CBEs should identify farmers qualifying for QBMPS bonus payment and how to calculate the bonus due to each farmer based on the bonus type and the milk volumes delivered during the month.

2. Scope

The WI details how CBEs should: prepare lists of farmers who bulk their milk into each of the qualifying project milk cans; compile milk volumes for each qualifying farmer; calculate the QBMPS bonus due to each farmer; compile the total bonus payment for all qualifying farmers; and raise the bonus payment invoice.

3. References

HC Directives (DR-002)

4. Definition of terms

CBE	Cooling and Bulking Enterprises
QBMPS	Quality-Based Milk Payment System

5. Description of activities

1. Prepare Bonus Payment

a) Listing of the farmers

The CBE Accounts Clerk lists all the farmers who bulk their milk into each qualifying project milk can, as per *QBMPS Bonus Report CBE* (RP-022).

b) Compiling the total milk volumes

The CBE Accounts Clerk compiles the total milk volume for each individual farmer qualifying for bonus payment.

c) Calculation of bonus payment per farmer

The CBE Accounts Clerk calculates the bonus payment due to each qualifying farmer by multiplying the farmer's total milk volume with the bonus price corresponding to the bonus type as directed by the Project Manager/Dairy Operations Manager. The prices are indicated on the HC directive (DR-002).

d) Preparation of the QBMPS Bonus Report CBE (RP-022) and invoice

The CBE Accounts Clerk then compiles the bonus payment for each farmer in one report – the *QBMPS Bonus Report CBE* (RP-022) – and raises an invoice against the total bonus amount for payment by Happy Cow.

e) Bonus payment for milk transporters in Olenguruone dairy

The Accounts Clerk in Olenguruone CBE calculates a 20% QBMPS bonus for the milk transporter from the total bonus of the qualifying milk transported during the month.

The CBE Accounts clerk then submits the invoice and the *Motorbike Transport* (RP-022A) to Happy Cow for payment.

2. Cross-checking milk volume deliveries against milk dispatches

a) Check Delivery Report vs Delivery Reports

Add total volumes milk delivered of report *Milk Receipt CBE Platform* (RP-007) (received) versus *Daily CBE Milk Dispatch* (RP-008) (dispatched). Notice must be given that milk yield still in storage at the CBE must be corrected. In the event there is a substantial discrepancy (>2%) between received vs dispatched it must be reported to CBE management using the *Weight Difference Report* (RP-017).

6. Report- and Record-templates

RP-022 QBMPS Bonus Report CBE

QUALITY-BASED MILK PAYMENT SYSTEM

CBE Name & Happy Cow

Date: ……

Bonus type: …….. Payment rate: 80%

Can no.	Supply no.	Farmer's name	Qty (Kgs)	Amount

RP-022A: Motorbike Transport (20% bonus payment)

QUALITY-BASED MILK PAYMENT SYSTEM

CBE Name & Happy Cow

Date: ……

Bonus type: …….. Payment rate: 20%

Can no.	Supply no.	Transporter's name	Qty (Kgs)	Amount

RP-017 Weight Difference Report

No report format required / Hand written report

ANNEX C. COMPANY / PROJECT DIRECTIVES

DR-001: CBE DIRECTIVES – MILK COLLECTION OPERATIONS

Company ID	
Doc No.	DR-001
Editing No.	
Title	CBE directive CP operations
Date of issue	01 March 2018
Doc type / issued by	Directive by CBE management
Approved by	

1. Cleaning of the Collection Point (CP)

The farmer on duty is expected to clean the floor as well as the water trough which serves as a water-bath for cooling milk while awaiting collection. They should be cleaned through scrubbing with water and soap. The soap should be odourless and easy to rinse. The trough should be thoroughly rinsed before putting clean water. The Prefect together with the farmers should agree on the water level appropriate for the trough. The Prefect should mark the agreed point for convenience. The water in the trough should be emptied after every three days and replaced with clean water. During cleaning, the walls of the CP and the cobwebs should also be attended to.

The farmers delivering milk to a particular Collection Point (CP) are expected to clean the CP as scheduled by the Prefect, which instils a sense of ownership among them. Farmers must sign the Cleaning Schedule record after they have done their scheduled tasks.

2. Preparation for grading tools

The milk testing equipment, including the lactometer, measuring cylinder and the alcohol gun and glass cup/plate, need to cleaned by the Grader between tests. This is to prevent cross-contamination of milk between tests. The Prefect should provide a container to facilitate storage of water while the farmer on duty should put some water in the container provided.

3. Use of plastic containers

The farmers under the QBMPS should deliver milk using aluminium or food grade plastic containers. Milk delivered using other plastic containers will not be accepted. In the case of rejected containers, the Prefect will report to the Milk Chain Coordinator (MCC) who will advise the farmer on how to access the recommended milk can. The farmer will be issued with a recommended milk can based on the agreement with the store clerk (working in the CBE agrovet) on how the farmer will make payment for the can.

4. Organising farm group can ownership

- The MCC shares the list of farmers and their specific can numbers (RP-018) with the Prefect. The Prefect pins the list on the wall of the collection point and informs the farmers about the list and its importance.

- During milk collection as well as bulking into the 50 litre cans, the Prefect observes the implementation of can ownership based on RP-018.
- The MCC has the mandate to adjust the list when need arises. The Prefect and the Grader should inform the MCC in case there is a need for changes to the list. This is because the MCC will likely not be present during the time this event will occur. However, the Grader should always carry an extra can to accommodate excess milk (i.e. when farmers in a can deliver more than 50 litre capacity.
- The MCC will update the CBE on the position of can attachment/ownership on a monthly basis.

5. Milk rejections during quality testing at CPs

Milk rejected at the farm level should be left with the farmers. The milk should be rejected if:

a. The lactometer reading does not lie within the range of 27-33 (1.027-1.033g/ml[3])
b. The milk has an abnormal smell
c. Clots are observed when the alcohol test is conducted
d. The peroxide strip turns blue

6. Milk delivery time and collection

The driver must record the departure time and arrival time in the book provided by the gate. This book will be monitored by the Project Manager from time to time. The time taken for milk collection will be detailed in the report (RP-023) for every route. Milk collection should be done only at designated points along the routes and therefore the Transporter will not stop at each farmer's gate. Consequently, less time will be spent in milk collection, ensuring completion of milk reception activities complete by 11:00 am. Milk shall not be accepted after this time. The Transporter shall report to the manager in case the transportation vehicle needs repair or has broken down during milk transportation.

To prevent milk spillage and contamination during transportation, the milk Transporter shall drive the truck away from sources of contamination and shall avoid unnecessary delays that can lead to milk spoilage.

The Graders shall handover their journals to the Accounts Clerk immediately upon arrival at the reception platform.

7. Personal hygiene

Unhealthy and unkempt persons may transmit zoonotic agents to animals or contaminate milk with these agents. All milk handlers will be expected to shower, and wash and sanitise their hands before handling milk. Clothes should be clean and, where possible, an overall gown/dust coat should be worn to avoid milk contamination. The following requirements are compulsory in milk handling.

a. Regular medical examination and certification for all milk handlers. Unhealthy persons will not be allowed to handle milk or access dairy premises.
b. Maintain personal cleanliness and grooming.
c. Wear protective clothing overalls, overcoats, hand gloves, caps, mouth covers and gumboots.
d. Jewellery, bangles, bracelets, long hair that is uncapped, and fingernails that are long or dressed in nail polish or similar substance will not be allowed.
e. Observe the basic principles of hygiene, such as washing hands with soap, covering the mouth when coughing and their nose when sneezing, no smoking or chewing while working.

8. Milk dispatch at the CBE

The CBE QC is responsible for milk dispatch to all processors. He should ensure that the necessary reports (RP-004 and RP-004A) are properly raised before dispatch. The CBE manager should advise on the quantities to be supplied to each processor. The CBE QC should additionally verify the quality parameters indicated by the processor QC.

9. Bonus awards

The MCC is responsible for following up and training farmers that qualify for a bonus as well as those whose milk has been rejected. Farmers that qualify for bonus should be trained to enhance consistent milk quality and encourage them to keep up their good work. For farmers that do not qualify for a bonus, training should focus on parameters that led to them being denied the bonus. This information should form the basis of further training and by the MCC and extension team. In addition, the MCC should perform random checks of farmers' statement to confirm can ownership and whether the bonus amount is indicated.

DR-002: PROCESSOR DIRECTIVES – GENERAL OPERATIONS

Company ID	
Doc No.	DR-002
Editing No.	
Title	HC directive
Date of issue	01 March 2018
Doc type / issued by	Happy Cow management
Approved by	Managing Director Happy Cow

1. Milk sample bottles, sampling stirrer and dipper cleaning

The milk sample bottles need to be thoroughly cleaned using hot water, soap and a scrubbing brush. Rinsing should be thoroughly – up to four times – using potable water to ensure effectiveness. The inside of the bottle should not feel slippery after cleaning. Cleaning should also involve removing all the remnants of labels inserted previously. The bottles should then be halfway filled with water and placed in an autoclave at 120^0C/15min for sterilisation.

The sampling dipper for drawing the sample and stirrer used in stirring milk to ensure homogeneity should be properly cleaned using soap. They should then be rinsed and sanitised using an ethanol 60-70% concentration just before use. They should be cleaned again after use.

2. Sampling and sample reception

The bottles should be labelled as per the *Sampling Schedule/Daily Sample Analysis Register* (RP-013). They should then be handed over to the Bulk Tanker Driver for transportation to the CBE platform, where further sampling is done. The tanker sampling at the Processor (Happy Cow) should also be done in a labelled sterile bottle. Sample reception at HC should include filling the sample submission form. The QCs at the CBE and Processor platforms, as well as the CBE Manager, should sign as customers to the HC Lab, while the Processor QC should sign to indicate acknowledgement of the samples.

3. Parameters to be analysed

Under the QBMPS, the parameters to be analysed for every sample collected at the HC laboratory include total plate count, antibiotic residues, total solids, freezing point and somatic cell count. In addition to these tests, the tanker sample should be analysed for aflatoxin contamination. The results should be uploaded to the QBMPS software and soft copies retained as folders in the computer on monthly basis. The procedures to be applied in analysis should adhere to AOAC and/or ISO standards, as described and filed in the document HCL/QP/012.

At the CBE laboratory, the following tests should be carried out for all milk cans: organoleptic, alcohol, density, peroxide and Delvo BLF. Confirmatory tests including, lactic acid and resazurin test should be done in the laboratory before bulking in the cooler. Yoghurt tests for all the samples should also be done. Milk having antibiotic residues will not be accepted at HC.

4. Bonus award reports

The reports for bonus award should be generated in a timely manner – by the 3rd of the next month – to facilitate payments for the previous month. The software will compute the average results for the two sampling sessions. However, manual calculations should be done by the Project Manager prior to sharing the results to confirm the efficiency of the computer calculations.

The following table describes the test parameters, the grades, QBMPs standards, KEBS standards and the scores per grade.

Test	Grade	QBMPS Standard	KEBS Standards	Score
Total plate count (Units in cfu/ml)	A	0 - 2,000,000	<200,000	50
	B	2,000,001 -10,000,000	200,000 - 1,000,000	0
	C	>10,000,001	>2,000,000	-50
Antibiotics residue	All	Negative	Negative	15
Freezing point	All	-0.500-	-0.525 to -0.565	20
Total solids	All	>11%	>11.75%	15

NB: Every milk can that manage to get between 70 -100% score, the farmers should be awarded extra 2 shillings. For every milk can that gets a score of between 40 to 60%, the farmers should be awarded an extra shilling per kg of milk delivered.

After the reports have been verified, the Project Manager will share them via email with the CBE and a copy to the Milk Chain Coordinator. The email should indicate which cans will not be awarded bonus because they were rejected at the CBE platform during the month. The CBE will prepare the *Suppliers list & Volumes delivered* (RP-017) and an invoice to facilitate payment. The project manager will verify (comparison of the RP-017 and the email details shared to CBE) the cans that have been considered for payment and advise the Finance Manager at HC accordingly.

5. **Delivery by individual farmers**

For farmers that deliver milk directly at the CBE platform, quality control should be carried out by the Processor QC at the CBE. This will involve attaching the farmers to specific milk cans and ensuring that their names are properly inserted in the CBE computer software. The QC will also be in charge of organising the training for these farmers.

6. Milk dispatch at the CBE

During milk dispatch, the Processor QC should ensure that milk from each project route is bulked in a separate compartment of the tanker. Moreover, the QC should ensure that proper milk handing over is done for all parties, and recorded in the *Daily CBE Milk Dispatch* (RP-004) and *Bulk Tanker Dispatch Note* (RP-004A). The quality parameters analysed and the compartment in which the project milk is bulked should be recorded on both RP-004 and RP-004A.

7. CIP procedure

After the Bulk Tanker Driver has delivered milk at the Processor, a full CIP should be done immediately. The QC should liaise with the production team at HC to ensure this is accomplished. The driver should clean the outside of the tanker only at designated points. The QC should ensure that the driver cleans the tanker.

Milk Sampling Procedure

Company Identification:	Document Title:	Document Type:
Happy Cow Ltd.	**Sampling procedure (SP)**	**SOP 1**
Version Number: **00**	Date of Issue: **Aug 2017**	Document Number: **HCL/QP/10/SP**

1. Clean the sampling dipper and stirrer for every sample and rinse properly.
2. Stir the milk properly to ensure homogeneity (for the can at least 3 times and for the cooler/tanker for at least 5 minutes) before sampling.
3. Using ethanol of at least 76%, sanitise the sampling dipper, stirrer and your hands.
4. Draw a sample.
5. Open the sampling bottle, empty the water in it and put the sample in it.
6. Close the sampling bottle.
7. Insert the sampling bottle in the cool box with ice water and close the cool box or put the sample in a fridge to cool to below 4^0c.

NB: the sampling bottle should be sterile (autoclaved at 120^0c) and labelled.

Example of a Milk Sample Submission Form

Document Title: **Sample Submission Form**	Document Type: **FORM**	Document Number: **HCL/QP/02/SSF**
Version Number: 00	Date of Issue: **Jan 2017**	Page 1 of 1

1. Sample:……..

2. Packaging:……

3. Labelling/Identification

Trademark:……

Date of Manufacture: ……..

Any other marking: ……

4. Size of item: ……..……..

5. Condition of item:
……

6. Reference standard specification:
……
……

7. Equipment to be used:
……
……

8. Test request:
……
……

Laboratory:……

Purpose of testing:……

Scope of testing:……..
……
……

9. Customer's Name:……..

Organisation:……..

Address: ……

Tel: …… ……..

E-mail: ……

Signature: ……Date: ……..

10. File reference No: ……...

11. Sample reference No: ……..
……

12. Testing charges (Kshs):
……

Receipt/LPO No: ……

Invoice No: ……

13. Receiver's Name: ……

Signature: ……..

Date: ……

14. Notes on transmission of results:
…….....
.....……

15. Item return/disposal:
…….....……
……..……