



الجمعيّة العلميّة المَلَكِيّة
Royal Scientific Society

Resource Efficient and Cleaner Production (RECP) Self-Assessment Checklists for Jordanian Micro-Sized Dairy Production



Implemented by

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Reviewed by

STENUM
Dr Johannes Fresner
Dr Christina Krenn
National Food Experts
Dr Rudina Batarseh
Dr Maysoun Al-Shareef

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Water, Environment and Climate Change Centre (WEC)/Cleaner Production Unit (CPU)

National Energy Research Centre (NERC)

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Authors

Eng. Baraa Matalqah, RSS

Eng. Abdullah Abu-Sada, RSS

Reviewed by

Dr Johannes Fresner, STENUM

Dr Christina Krenn, STENUM

Dr Rudieneh Batarseh, National Food Expert

Dr Maysoon Al-Sharif, National Food Expert

Eng. Jehan Haddad, RSS

Eng. Rawia Abdullah, RSS

Eng. Husam Kilany, RSS

Eng. Muhieeddin Al-Tawallbeh, RSS

Graphic Design

Ms Ashly Osborn, RSS

Ms Farah Hallaq, RSS



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For more details, please contact Eng. Jehan Haddad/Project Manager

Telephone: +962 6 5344701 Ext. 2571

Email Address: jehan.haddad@rss.jo



Introduction

This Resource Efficient and Cleaner Production (RECP) Self-Assessment Checklists for Dairy industries were developed by the Cleaner Production Unit (CPU)¹ and National Energy Research Centre (NERC)² at Royal Scientific Society (RSS)³ – Jordan in cooperation with STENUM⁴ and national food experts⁵. This initiative was supported by the “Employment-oriented MSME Promotion” project implemented by the Gesellschaft für Internationale Zusammenarbeit (GIZ) on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ)⁶ to support Jordanian micro-scale industries to become more competitive by increasing efficiency and productivity, while also reducing environmental impact through implementing RECP. RECP aims at promoting the shift toward sustainable consumption and production (SCP) in Jordan.

This self-assessment checklists are designed to be used by the business owners of micro-scale dairy industries including home-based businesses in Jordan (4 employees or less) to help them to identify simple and practical RECP measures that can be undertaken to reduce the cost of production and enhance the enterprise’s overall productivity. The checklists cover the following area:

- General personal hygiene & food safety
- Good housekeeping practices
- Knowledge and know-how
- Information system
- Efficient use of water
- Efficient use of materials
- Efficient use of energy



External RECP experts are required to assist the company to implement the RECP assessment, while this checklists are helpful to be utilized as a tool in the RECP service in addition to their benefit (if used alone) to raise the awareness of the industries toward main issues that may directly or indirectly affect their resource efficient performance.

RECP is a preventive, systematic and continuous improvement approach which minimizes the generation of non-product outputs (wastes and emissions) at the sources through efficient utilisation of technical/economic and natural resources (energy, water and raw material) in the industrial processes. Accordingly, assist the industry to prevent or reduce the generation of wastes and emissions, enable it to comply with the environmental regulations and achieve environmental and economic benefits at the same time.

¹ www.cp.org.jo

² www.nerc.gov.jo

³ www.rss.jo

⁴ <https://stenum.com/>

⁵ rudina.batarseh@ifda.jo & maysoon.alshareef@gmail.com

⁶ www.giz.de/en/worldwide/75975.html

Do you know that increasing the temperature in a chilled room by 1 °C will reduce energy cost by 4%?

If you leave water running from a hose with 1/2-inch outlet diameter, the loss will be 2.5 m³ per hour!

Do you know that by using a bucket and a wristwatch you can characterize such losses?

Do you know that milk from sick cows or animals undergoing treatment with antibiotics must not be used for cheese making or any other milk product, even after the end of the treatment for a certain time (withdrawal time)?



RECP is a first step for continuous improvement of the company's operations. It will assist the company to:

- Optimize the utilization of resources and minimize the generation of waste and pollution.
- Create the awareness and knowledge in the field of resource efficiency and build the company's capacity on RECP approach.
- Reduce production cost by minimizing non-product output, and accordingly being able to increase competitiveness and market share.
- Increase the efficiency of production and productivity through better utilization of materials, water, energy, equipment, labour and time, better production planning, more efficient supply chain and waste re-use and recycle.
- Improve health, safety and morale of employees.
- Improve cost accounting/pricing and monitoring systems in addition to the information and management systems for better tracking of resources utilization.
- Being recognized as green industry that can apply for available national resource efficiency initiatives such as the related financing programs, awards and incentives.

The following generic RECP strategies/principles can support the identification of options for any production company.

- Good housekeeping (including Good Health Practices)
- Segregation of generated wastes
- Input material change
- Process, technology or production change
- Improved process control
- On-site reuse/recovery or/and recycling
- Production of useful by-products
- Modification of equipment or products.



RECP self-assessment checklists

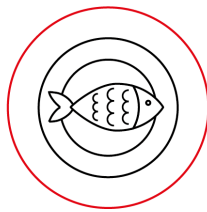
General personal hygiene & food safety

Good Personal Hygiene and Good Health Practices implementation in food production cycle play an important role in food safety and the health and well-being of the consumers. Implementation of the food safety Five Keys during food handling process is essential to achieve high quality and safer food for the consumers, foodborne illness mostly results from neglecting those keys commonly caused by pathogens like bacteria and viruses and other microbiological, chemical, and physical hazards in raw materials, or end products, resulting as food poisoning outbreaks in community.

Food Safety Five Keys are:



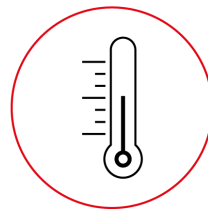
Keep clean



Separate
cooked &
raw food



Cook food
thoroughly



Keep food at
safe
temperatures



Use safe
water & raw
materials



Do you know that you have to stop food production when you feel sick or having any clinical signs related to contagious diseases like diarrhea or cough or skin irritations or any other epidemic illness?

Microbiological hazards include bacteria viruses, parasites and environmental pathogens. **Chemical** hazards include food allergens, substances such as pesticides and unapproved food additives.

Physical hazards include potentially harmful foreign matter that may cause choking, injury or other adverse health effects.

The food safety and quality are the wings of success in efficient resources management, and any defect in one of them will be a direct reason of product rejection by consumers, and unfortunately lead to decrease market value of the product, and fall to achieve the project goals, from aside, and face legal issues in the other side. The role of awareness manuals and technical assistant for those in charge of projects will guarantee to detect and solve any problem before selling then give safe and high-quality products to consumers, and efficient resources management.

General personal hygiene & food safety

Question	Answer (See Annex 1)
<p>Are production area and tools (floor, counters, cooking surfaces, sinks, bowls, pots, etc.) clean and sanitized? Is there bathroom and washing sink connected to the working area?</p>	
<p>What kind of materials (chemical, soap, water, etc.) do you use to clean and sanitize the surfaces used for ingredients processing and product packaging? Are they food grade materials?</p>	
<p>Are cleaning and sanitizing compounds stored away from the production area in closed place with an informative board?</p>	
<p>Are the workers wearing clean clothes (gloves, clean apron, hair covers, etc.)? Do they change the gloves and wash their hands frequently?</p>	
<p>Do you eat, drink or smoke in the production area?</p>	
<p>Do you prepare foods for your family at the same time you are preparing food for your clients?</p>	
<p>Are pets or children allowed to enter the kitchen or the working area?</p>	
<p>How do you balance between the needed time to do your business and your family commitments?</p>	
<p>In case you have to prepare food in large quantities, do you ask for a help from other people who are not working with you permanently? How you make sure they are safe?</p>	
<p>Are raw materials or products stored in separate area from products and handled at proper storage conditions? Are they checked frequently?</p>	
<p>Are the products well packaged/wrapped to prevent cross contamination (defined as the transfer of bacteria or other microorganisms from one substance to another that can happen during any stage of food production)?</p>	
<p>In case you have to transfer refrigerated products to the market, do you transfer them in mobile refrigerators? How do you control the container's temperature for long rides?</p>	
<p>What is the source of water (municipal water, potable water, rainwater) used in the production? How do you clean your water tanks?</p>	
<p>Are production area/storage areas contain insect traps? Do you use insecticides and rodenticides to control them?</p>	
<p>Do you have disease free certificate for Health Authority? Do you have your national vaccination certificate?</p>	

Good housekeeping practices

Good housekeeping practices are ongoing operation and the implementation of these practices is relatively easy and the cost is usually low.

Good housekeeping practices includes keeping working area clean and ordered, maintaining floors free of slip, providing adequate and proper layout for the whole production area, providing proper storage areas and removing the waste from production area.

Question	Answer (See Annex 2)
Are there noticeable spills or leaks? Is there any evidence of past spills?	
Are there damaged or defective containers, bags, etc.?	
Are the products labelled and the dates of production and expiry documented?	
Are the conditions of storage areas of raw materials and final products monitored and documented regularly?	
Is the production area (kitchen) well-designed and adequate for your present needs and planned expansion? Does it fit with licensing requirements, 15% of overall house's area?	
Do you have a plan for waste disposal?	
Do you segregate and classify food wastes? Are there by-products or waste that can be utilized or reused and recycled?	
Do you monitor the consumption of fuels used for heating? Do you have solar water heating system?	
Are you aware of local regulations for establishing home-based food business?	
Do you primarily use water for cleaning (floor, kitchen's tools and equipment) in your business?	
Do you monitor and record the volume of water used in each production stage?	
Do you conduct regular cleaning and maintenance for water storage tanks?	
Do you monitor the monthly consumption of primary raw material?	
Do you evaluate and record waste quantities of the final products?	

Knowledge and know-how

The well knowledge of the raw materials' quality, production processes and operating conditions, cleaning procedures and critical control measures that may affect the safety and quality of the products is very important to produce safe, high quality and competitive products and to reduce the generation of non-product outputs at source.

Question	Answer (See Annex 3)
Do you know the difference between cleaning and sanitizing?	
Are you and your staff aware of the requirements of food safety and personal hygiene?	
Do you know how long fresh milk or dairies products can be stored before they start to spoil?	
Do you know that milk-containing antibiotics should not be used in the production of yoghurt and cheese? So as milk produced form sick cows?	
Do you know how to test if the received milk is fresh, safe, properly handled, and has not been adulterated by adding water or other material like starch?	
Can you realize that white cheese spoils according to its colour, taste and smell, as well as changes in the brine in which it is kept?	
Do you know that preservatives like Natamycin and Sorbic Acid shall not be used when making traditional labneh?	
Do you understand that dairy products have very critical risk of causing food poisoning? Do you have any measures to avoid this risk?	
Do you aware of the available Jordanian standards for milk and milk products?	
What are the proper pasteurization conditions of fresh milk?	
What type of tool do you use to pasteurize the milk?	
What are the proper conditions to pasteurize fresh milk for yoghurt production? Do you have a thermometer to major temperature in your working area?	
Do you know that for food safety of your products you are allowed to use steel cattle and containers only? Plastic are not allowed.	

Information system

The monitoring and regular evaluation of the raw materials' quality and consumption, energy and water consumption, production cost per each product, production processes, operating conditions, cleaning procedures and critical control measures that may affect the safety and quality of the products are very important to produce safe, high quality and competitive products and to reduce the generation of non-product outputs at source.

Question	Answer (See Annex 4)
Do you know the value and cost of having a good and accurate information system?	
Do you record the amount of raw materials and ingredients that are used in the production?	
Do you record the main processing conditions in the production process (i.e. time, temperature, etc.)?	
Do you record the daily cash used to buy raw materials, ingredients and packaging materials?	
Do you keep record for your daily sales?	
Do you know how to calculate your profit or loss?	
Do you know how to calculate your weekly or monthly production rate?	
Do you know how to do a comparative report for you monthly consumptions and sales?	
Do you know how to monitor and improve your business productivity?	

Efficient use of water

Question	Answer (See Annex 5)
Do you primarily use water for cleaning (floor, kitchen's tools and equipment) in your business? How do you control the water consumption during the cleaning process?	
In which production steps do you use water? And what are the measures you implement to reduce the water consumption?	



Efficient use of materials

Question	Answer (See Annex 6)
Do you monitor the monthly consumption of primary raw materials (milk) and ingredients (salt, ripening culture, etc.)?	
Do you test the raw milk to check its quantity and quality before receiving it? Do you keep a record for your invoices with your supplier's name?	
Do you have detailed written recipe for each product that the workers shall follow it? Do you have working sheets for workers?	
Do you evaluate and record waste quantities of the final products?	



Efficient use of energy

Question	Answer (See Annex 7)
Do you monitor the monthly electricity bills and the monthly LPG bottles changes?	
When you leave your workday or break, do you leave electrical equipment or appliances on?	
Do you turn off the lights you are not occupying?	
Check if your lighting tubes are with “LED” type or not by doing the following quick test: 1. Turn off the light. 2. Turn on the light. Note the fast response and stability of the light or not.	
What is the full capacity of the existing cookers? How much cooking times the cooker used daily?	
Do you check if the gas cooker’s eyes are always clean?	
What is the age of used refrigerator? Check if it has an energy label.	
Check if the refrigerator is located near to heating sources (gas cooker, direct sun radiation, etc.)	
Do you have solar water heating system?	

Evaluation of the improvement of resource efficiency performance

RECP emphasizes on continuous improvement. There should be periodic monitoring to determine whether positive changes are occurring after implementing the RECP assessment and resulted corrective actions to evaluate the level of achievement and take further action to improve the performance.

The typical indicators to evaluate the effectiveness of the implemented RECP actions are:

- Reductions in wastes and emissions per unit of production.
- Reductions in resource consumption (including energy) per unit of production.
- Improved profitability.

To evaluate the actual achieved savings from implementing the RECP actions, the company shall monitor some parameters such as the ones shown in the following table and compare them with baseline indicators of previous year to evaluate the performance progress and take necessary actions to sustain and improve it.

Table 1: Performance monitoring

Parameter	Unit of monitoring	Frequency	Current value	Previous value	Evaluation / needed actions
Raw milk consumption	l/kg of product	Monthly			
Water consumption	l/kg of product (or per kg of raw milk)	Monthly			
Fuel consumption	No. of LPG bottles/kg of product (or per kg of raw milk)	Monthly			
Electricity consumption	kWh/kg of product (or per kg of raw milk)	Monthly			
Solid waste	g/kg of product (or per kg of raw milk)	Monthly			

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Annex 1

Benefits

- Reduce losses in raw materials.
- Reduce losses in final products.
- Reduce amount of waste.
- Reduce the needed cost for production.
- Improve hygienic conditions.
- Earn and maintain the trust of the consumer.

Question	Actions to take
<p>Are production area and tools (floor, counters, cooking surfaces, sinks, bowls, pots, etc.) clean and sanitized?</p> <p>Is there bathroom and washing sink connected to the working area?</p>	<ul style="list-style-type: none"> – Prepare a cleaning schedule to control the cleaning and sanitary operation. The plan has to include at least the task/production stage, frequency of cleaning/ when to clean, how to clean and the responsible person. For example: Task: washing the pans used for pasteurization the milk. Frequency/when: immediately after pasteurization and emptying the pan. How: Wash with detergent and hot water, followed by sterilization with bleach and rinsing with clean water. Responsible person: Ahmad – Clean the production area, toilets and washing facilities and stores every day. – Do not leave dirty equipment until the end of the day. – Keep the area around the production area clean and tidy. – Maintain optimal drainage system in the processing area and ensure abundant water supply for effective cleaning.
<p>What kind of materials (chemical, soap, water, etc.) do you use to clean and sanitize the surfaces used for ingredients processing and product packaging?</p> <p>Are they food grade materials?</p>	<ul style="list-style-type: none"> – Wash all tools with hot water and acidic or caustic cleaning materials. – Then rinse them with chlorinated water. – Allow them to dry in the air, because wiping with cloths can re-contaminate them. – If cloths are used, they should be washed with detergent and boiled for 10–15 minutes to sterilize them. They should be hung on a line to dry. Coloured cloths should be used as coloured threads can be seen more easily than white threads if they are lost in tools or in the product. – Using brushes with coloured bristles is the effective way to clean the surfaces.

Question	Actions to take
<p>Are cleaning and sanitizing compounds stored away from the production area in closed place with an informative board?</p>	<p>All cleaning and sanitizing compounds shall be identified, held, and stored away from production area in a closed labelled place.</p>
<p>Are the workers wearing clean clothes (gloves, clean apron, hair covers, etc.)? Do they change the gloves and wash their hands frequently?</p>	<p>All employees shall conform to hygienic practices to protect against contamination of food by:</p> <ul style="list-style-type: none"> – Wearing gloves, clean apron, hairnets, headbands, caps, beard covers and mask. – Washing hands thoroughly (and sanitizing if needed) before starting work, after each absence from the work station, after touching raw food and at any other time when the hands may have become contaminated. – Don't work when you are sick, it is better to lose sales than to cause a foodborne illness. – Keep fingernails cut short. – Do not wear perfume or nail varnish as these can contaminate products. – Cover all cuts, burns, sores and abrasions with clean, waterproof plasters. – Don't wear rings or accessories during work it may fall in products.
<p>Do you eat, drink or smoke in the production area?</p>	<ul style="list-style-type: none"> – Do not eat food, chew gum, drink beverages or smoke inside the kitchen or working area. – Wash your hands and wrists thoroughly after eating, drinking or smoking. Dry them on a clean towel.
<p>Do you prepare foods for your family at the same time you are preparing food for your clients?</p>	<ul style="list-style-type: none"> – Do not cook at the same time in order to prevent cross contamination. – It is important that a suitable room is used exclusively for dairy processing. A household kitchen is unsuitable because of the risk of contaminating products.
<p>Are pets or children allowed to enter the kitchen or the working area?</p>	<ul style="list-style-type: none"> – Keep pets, children and non-food workers out of the production area to prevent food poisoning, as a result from contamination. – Highly recommended to set aside time to finish your business or to separate the production area where you run your business from your own kitchen.

Question	Actions to take
<p>How do you balance between the needed time to do your business and your family commitments?</p>	<p>Set aside time to finish your business or separate the production area where you run your business from your own kitchen.</p>
<p>In case you have to prepare food in large quantities, do you ask for a help from other people who are not working with you permanently?</p> <p>How you make sure they are safe?</p>	<ul style="list-style-type: none"> - Check the knowledge of the worker in food safety and proper food handling techniques. - Try to not involve the worker in the critical production processes.
<p>Are raw materials or products stored in separate area from products and handled at proper storage conditions? Are they checked frequently?</p>	<ul style="list-style-type: none"> - Store products off the floor in a cool, dark store that has good ventilation and protection against insects and rodents. - Sufficient space should be allowed between cases and pallets to allow air circulation, which encourages even chilling and allow you to check expiry dates. - Store's doors should not have gaps beneath them and should be kept closed to prevent insects and rodents from getting in and destroying stocks of products, ingredients, or packaging materials. - Fresh milk should be stored immediately within 4 hours of milking in a refrigerator below 4°C, and that refrigerator should not be used to store final products or any other materials, to prevent cross contamination. - Store pasteurized milk in a refrigerator below 4°C, noting that it has a shelf-life of 2-5 days when stored under refrigeration. - Yogurt may be kept well covered in a refrigerator below 4°C for 7 - 14 days past the "sell-by" date. - Store white boiled cheese at room temperature in brine using food grade containers. - Store butter into greaseproof paper, foil or plastic bags in a refrigerator below 4°C. The shelf life of butter is reduced if it is stored without refrigeration. - Store ghee at room temperature away from heat and sunlight. It has a long shelf life if it is stored in a cool place using airtight, lightproof and moisture-proof containers to slow down the development of rancidity.

Question	Actions to take
<p>Are the products well packaged/wrapped to prevent cross contamination (Defined as the transfer of bacteria or other microorganisms from one substance to another that can happen during any stage of food production)?</p>	<ul style="list-style-type: none"> - Milk and yoghurt are typically packed in wax-coated or plastic-lined paperboard cartons, plastic bottles and cups, plastic bags or reusable glass bottles. - Butter and cheese are wrapped in foil, plastic film or packaged in small plastic containers. - In Jordan the primary packaging materials used for dairy products are glass bottles, Tetra Pak films and plastic cups for labneh. Stainless Steel containers shall be used to produce dairy products and boil them. - The following are the more important general requirements of dairy products packaging materials/ containers: <ul style="list-style-type: none"> - must be non-toxic and certified food grade - sanitary protection - moisture protection - air and odour protection - light protection - resistance to impact - ease of opening - ease of disposal - low cost
<p>In case you have to transfer refrigerated products to the market, do you transfer them in mobile refrigerators? How do you control the container's temperature for long rides?</p>	<ul style="list-style-type: none"> - Transfer cold products in cold containers and monitor the temperature regularly using a thermometer, the temperatures should not exceed 4°C. - Milk should be cooled below 4°C immediately after milking and kept at this temperature while being transported.

Question	Actions to take
<p>What is the source of water (municipal water, potable water, rainwater) used in the production? How do you clean your water tanks?</p>	<ul style="list-style-type: none"> – Water used in production processes should be free of chemicals and microbial contamination. – Use potable water, however, other sources of water could be used after checking its quality according to JS 286/2015 for drinking water. – Rainwater is relatively free from impurities, but it could be contaminated with the impurities picked up by rain from the atmosphere and during harvesting and storage of rainwater. Higher microbial concentrations are generally found in the first flush of rainwater. Rainwater is slightly acidic and very low in dissolved minerals and it can dissolve heavy metals (zinc & lead) from the metallic roofs and storage tanks or from atmospheric pollution. Microbial quality indicated by E. coli or thermotolerant coliforms and the physical quality (pH, turbidity, colour and smell) of rainwater needs to be monitored. The levels of lead, zinc or other heavy metals in rainwater should also be measured, when it is in contact with metallic surfaces during collection or storage. In case rainwater is disinfected with chlorine, the levels of total halogenated methane, chlorine dioxide and chlorite should be monitored. The quality of rainwater should be evaluated according to the limits stated in JS 286/2015 for drinking water.
<p>Are production area/storage areas contain insect traps? Do you use insecticides and rodenticides to control them?</p>	<ul style="list-style-type: none"> – Install fly and insect screens on windows and doors that are opened for ventilation. – Keep windows and door close, if opening them would result in food contamination. – Do not use insecticides and rodenticides chemicals during production. – All insecticides and rodenticides chemicals shall be identified, held, and stored in a manner that protects against contamination of food, food-contact surfaces, or food packaging materials.
<p>Do you have disease free certificate for Health Authority? Do you have your national vaccination certificate?</p>	<ul style="list-style-type: none"> – It is important to be certified to be able to expand your production through having the needed licenses.

Annex 2



Benefits

- Reduce losses in raw and packaging materials.
- Reduce losses in final products.
- Reduce amount of waste.
- Reduce the needed cost for production.
- Control or eliminate hazards at production area.
- Conserve water and save energy.
- Reuse and recycling a maximum of raw and packaging materials.
- Improve working conditions and occupational safety.
- Reduce the volume of wastewater.

Question	Actions to take
Are there noticeable spills or leaks? Is there any evidence of past spills?	<ul style="list-style-type: none"> – The best way to control spills is to stop them before they happen. – Conduct regular cleaning of the production area and clean spills immediately once they are occurred. – Drip pans and guards where possible spills might occur.
Are there damaged or defective containers, bags, etc.?	<ul style="list-style-type: none"> – Store raw and packaging materials and final products in proper storage areas and do not put them directly on the floor. All storage areas should be clearly marked – Stored materials should not obstruct aisles, stairs or exits. – Stacking raw and packaging materials and final products inside cartoons and cross tying. – Ensure that the workers are handling and transferring these materials in a proper way. – Prepare cleaning and maintenance schedule for de-contamination, cleaning or disinfecting of storage areas.
Are the products labelled and the dates of production and expiry documented?	<ul style="list-style-type: none"> – Document the date of preparation as it will help you sell the older products before the new products. (First In ...First Out) – If the product is offered in the markets, the name of the product, dates of production and expiry, name and address of the producer should be documented, by clear font with non-easily removed label (Product's Display Label).
Are the conditions of storage areas of raw materials and final products monitored and documented regularly?	<ul style="list-style-type: none"> – Refer to "General personal hygiene & food safety" for the proper storage conditions. – Assign a worker to monitor the temperature of storage conditions on daily basis and document the readings in a logbook. – Verification can be conducted by putting glass of water inside the refrigerator for 24 hours, then measure the temperature of water using thermometer. Do not measure the temperature directly from raw material or product.

Question	Actions to take
<p>Is the production area (kitchen) well-designed and adequate for your present needs and planned expansion? Does it fit with licensing requirements, 15% of overall house's area?</p>	<ul style="list-style-type: none"> – Ensure that production area have an enough space for workers to move around easily. This reduces the likelihood of accidents, or workers getting in each other's way. – Ensure that food move between production stages without the paths crossing. This reduces the risk of contaminating finished products with raw milk. – Ensure that the production area is hygienically designed and easily cleaned to prevent contamination by insects, rodents or micro-organisms. – Ensure that floors have a proper drainage channels and keep the drains covered by net. – Prepare maintenance schedule for the internal space of your production area to remove cracks, peeling paint, toxic material on walls and floors. – Make sure that the production area has a good ventilation system to avoid mould growth on walls. – Be sure about the paint of the roof, must be in faire colour without crakes. – In your cleaning procedure, be sure to clean out of working time.
<p>Do you have a plan for waste disposal?</p>	<ul style="list-style-type: none"> – Collect the waste regularly and don not keep it in the production area. – Separate materials that can be recycled from those going to waste disposal facilities. All waste receptacles should be clearly labelled (e.g., recyclable glass, plastic, cartoons & papers, tins etc.). – Collect the waste generated from each step and weigh it at the end of each batch. This will help you to define the causes of losses in raw materials, semi-finished and final products (human error, tools, etc.).
<p>Do you segregate and classify food wastes? Are there by-products or waste that can be utilized or reused and recycled?</p>	<ul style="list-style-type: none"> – Yogurt that is surplus can be used to produce labneh or shanineh. – Collect and sell the by-product "whey" to small or medium dairy processing companies to be used as a raw material to produce qareesh cheese. Or reuse it as cattle feed or whey drinks.

Question	Actions to take
<p>Do you monitor the consumption of fuels used for heating?</p> <p>Do you have solar water heating system?</p>	<p>Normally home-based and micro-scale food businesses use LPG for heating, the following could be implemented to monitor and control the consumption of fuel used in all production processes:</p> <ul style="list-style-type: none"> – Record your consumption of LPG cylinders on monthly basis. – Check the LPG hose regularly for any signs of wear and tear. – Ensure that the workers are aware of the safety and maintenance tips for domestic LPG cylinders – Add a cover to the vessels used for cheese boiling and crud cheese production. – Preferred to have a manual fire extinguisher at your kitchen.
<p>Are you aware of local regulations for establishing home-based food business?</p>	<p>Under the Home-based Business Licensing Instructions for the Year 2020, Greater Amman Municipality (GAM) allows certain professions (i.e. Jameed, butter and ghee production) to be practiced from home. Article (9) of the Instructions stipulates special conditions relating to construction, equipment, production processes, storage, transportation of food items and general safety requirements. These Instructions are available online.</p> <p>In case you propose to GAM to get home based production license, you have to get approval from Jordan Food and Drug Administration (JFDA), as the official governmental body responsible of food safety and security in Jordan. JFDA inspection teams check your kitchen to be sure that you are implementing all the requirements, then you will proceed again to GAM to get your License.</p>
<p>Do you primarily use water for cleaning (floor, kitchen's tools and equipment) in your business?</p>	<ul style="list-style-type: none"> – Implement dry clean-up (sweep the floor or wipe the kitchen's tools and equipment) before washing with water. This action reduces the amount of water required to remove solid wastes. – Use hot water to clean oily surfaces. – Use low-volume and high- pressure water, this action involves only adding a new nozzle to the end of the hose or water tap. – Make sure that water taps are in good working conditions and there is no spillage and leakage. – Monitor water tanks and prevent spillage. – Turn off the water when not in use. – Instruct the workers to reduce the water consumption as much as possible.

Question	Actions to take
Do you monitor and record the volume of water used in each production stage?	<ul style="list-style-type: none"> – Record the volume of water used during each production stage on monthly basis. – Use low-volume and high- pressure water, this action involves only adding a new nozzle to the end of the hose or water tap. – Make sure that water taps are in good working conditions and there is no spillage and leakage. – Turn off the water when not in use. – Use small fan to cool products after incubation. – Instruct the workers to reduce the water consumption for the cleaning of raw materials as much as possible (e. g. by washing in containers / bowls and closing the water taps immediately after use). – Re-use the same water and chemicals of the second cleaning to the first cleaning for CIP. – Collect wastewaters from initial rinses and reuse them in the dairy farm for watering cattle (if it exists on-site).
Do you conduct regular cleaning and maintenance for water storage tanks?	<ul style="list-style-type: none"> – Make sure that the tank is covered to avoid any microbiological and chemical contamination. – Conduct regular cleaning for the tank. – Conduct regular check for the tank and hoses to avoid losses due to spillage or leakage.
Do you monitor the monthly consumption of primary raw material?	<p>Keep good records (quality, quantity and cost) of consumed primary raw material to help you:</p> <ul style="list-style-type: none"> – Determine your consumption per batch and hence determine the sources and causes of losses (human error, low quality inputs, etc.) if occurred. – Detailed knowledge about the operation and trend of your business help you to take the needed corrective actions for unnecessary losses. – The following actions could reduce the losses in the primary raw material: <ul style="list-style-type: none"> – Use milk once it is received or refrigerate it or keep it in a refrigerator below 4°C. – Ensure testing the milk before receiving it or returning it to the supplier. – Control the reception process of milk to avoid any losses at this stage. – Train the workers and control their performance on handling, transferring and unloading of milk to minimize losses in milk.

Question	Actions to take
<p>Do you evaluate and record waste quantities of the final products?</p>	<ul style="list-style-type: none"> – Record the waste volumes in the final product will help you to identify the problems (low quality inputs, human error, safety issues, lack of knowledge of food hygiene, improper milk processing, etc.) and to take the needed corrective actions. The following actions could reduce the losses in the final product: – Check the quality of received milk and check the possibility of having it from a local/nearby source. – Check the quality of water. More details are given in General personal hygiene & food safety. – Check the storage conditions. More details given in General personal hygiene & food safety. – Attend training courses on food safety and dairy processing.

Annex 3

Benefits for the company

- Improve hygienic conditions
- Reduce losses in raw material.
- Reduce losses in final products.
- Reduce amount of waste.
- Reduce the needed cost for production.
- Control or eliminate hazards at production area.

Question	Actions to take
Do you know the difference between cleaning and sanitizing?	Sanitizing is destruction of microbial organisms, but cleaning is removing visible soil or dirt. So, in cleaning which is the first step, you are trying to get rid of visible soils and removing them in the rinse phase. After that you have to do the sanitizing phase, where the sanitizer will come into contact for a specified period of time to kill the bacteria. Sanitation is what preserves your ability to sell a good product.
Are you and your staff aware of the requirements of food safety and personal hygiene?	Workers should be able to attend training courses to upgrade their skills on basic food safety and hygiene principles and they shall be aware of Five Food Safety Keys. For those who have time constraints due to other social duties (family and children), special institutions should be able to organize and provide learning opportunities within their convenient hours or through online platforms.
Do you know how long fresh milk or dairies products can be stored before they start to spoil?	The period of time each dairy product stays fresh varies significantly. More details are given in General personal hygiene & food safety. Dairy products are classified as high-risk food, which need to be handled in suitable way and suitable temperature away from critical zone (37-65 °C) which activate bacterial count and poison secretion.

Question	Actions to take
<p>Do you know that milk-containing antibiotics should not be used in the production of yoghurt and cheese? So as milk produced from sick cows?</p>	<p>Contamination of milk with antibiotics is caused by their overuse for treatment of cattle diseases, particularly mastitis. Milk containing antibiotics should not be used in processes that involve fermentation (i.e. production of yoghurt and cheeses) as they interfere with the fermentation.</p> <p>Shall not use milk produced by sick cows.</p>
<p>Do you know how to test if the received milk is fresh, safe, properly handled, and has not been adulterated by adding water or other material like starch?</p>	<p>Fresh milk should be slightly more viscous than water, white with a yellowish tinge depending on the fat content. There should not be discoloration, lumps or a high viscosity. It should have a bland, slightly sweet taste and a pleasant characteristic smell. Do the following steps to test the milk by your senses:</p> <ul style="list-style-type: none"> – Immediately smell the milk. – Observe the appearance of the milk. – If still unable to make a clear judgement, taste the milk, but do not swallow it. – Check the cleanliness of the container and the lid. – A simple test of quality is to mix a little detergent with the milk. If it remains liquid, it is suitable for use. <p>An accurate way to check the quality of the milk is to test some of its physical compositions (pH, acidity and density). The physical composition of milk are:</p> <ul style="list-style-type: none"> – Milk density 20°C: 1028–1032 kg/m³ – pH: 6.6 – 6.7 – total acidity: 0.14% for goat's milk and 0.16–0.19% for cow's milk <p>The pH of received milk can be checked using pH paper, it can be dipped into a sample of milk and the color change compared with a reference chart. For greater accuracy a pH meter should be used. This way is used in dairy factories but not common in home based business.</p> <p>Clot on Boiling (C.O.B) Test: Boil a small amount of milk in a spoon. If there is clotting, coagulation or precipitation, the milk has failed the test. If a milk sample fails in the test, the milk must contain many acid or rennet producing microorganisms or the milk has an abnormal high percentage of proteins like cloistral milk. Such milk cannot stand the heat treatment in milk processing and must therefore be rejected.</p> <p>The density of milk can be measured using a hydrometer known as a 'lactodensimeter', which is calibrated from 1.025 to 1.035 (or 25° to 35° as lactometer readings). Measurements should be</p>

Question	Actions to take
	<p>taken at 20°C. If a reading is obtained that is lower than 1.028, it indicates that the milk may have been diluted with water.</p> <p>Acidity can be measured by titration, but this method cannot be applicable at micro-enterprises.</p>
<p>Can you realize that white cheese spoils according to its color, taste and smell, as well as changes in the brine in which it is kept?</p>	<p>This spoilage is usually in the form of deterioration in the flavor and appearance of the cheese and the brine, which are sometimes accompanied by pink to red discoloration. It is believed that the cause of the bad flavor is microbes that are able to withstand the high salt concentration, the origin of such microbes could be the salt used in cheese production or by insufficient boiling of raw milk.</p> <p>Do simple test to investigate the purity of salt by dissolving a small amount in hot water and allowing any dirt to settle out. If salt has a pink tinge it should not be used, as this is an indication of bacterial contamination.</p>
<p>Do you know that preservatives like Natamycin and Sorbic Acid shall not be used when making traditional labneh?</p>	<p>Natamycin or Sorbic Acid increases the shelf life of labneh by inhibiting the growth of fungi. The use of these additives or any other preservative is forbidden in Jordan, and if you used them you will increase the shelf life of labneh by inhibiting the growth of pathogens. The authorities in Jordan do not approve the use of any of these additives.</p>
<p>Do you understand that dairy products have very critical risk of causing food poisoning? Do you have any measures to avoid this risk?</p>	<p>The risk of food poisoning could occur due to the following reasons:</p> <ul style="list-style-type: none"> – Improper pasteurization of the milk. – Lack of personal hygiene. – Re-infection after pasteurization (i.e. contact of processed milk with fresh milk or foreign materials, insufficient cleaning and disinfection, etc.). Cross Contamination – Improper storage conditions. – Presence of insects, mice and other animals that can be carriers of pathogenic bacteria. – Low quality of the main raw materials and ingredients. – Infection of workers and those responsible for production with pathogenic bacteria such as salmonella, E. coli or hepatitis C without showing symptoms on them, which may be transmitted through food to the consumer.

Question	Actions to take
	<p>Some measures to avoid the risk of food poisoning are:</p> <ul style="list-style-type: none"> – Workers should be aware of the health risks associated to any deviation from the main processing conditions (i.e temperature and time needed for pasteurization). – Monitor and record all processing conditions per batch. – Workers must pay strict attention to hygiene and sanitation rules during the whole production process. – Working area’s layout should be well designed and constructed to prevent food from being contaminated with microorganism, foreign materials and pieces of insects or other animals. – Keep working area clean and dry and set up a cleaning and inspection schedule. – Check and record the storage conditions for raw materials and products on daily basis. – Keep the doors and windows closed to prevent insects and pest from getting in and destroying the stocks of raw materials and products.
<p>Do you aware of the available Jordanian standards for milk and milk products?</p>	<p>The available national standards are:</p> <ul style="list-style-type: none"> – JS 1648:2020. Milk and milk products – Alshaneneh – JS 135:2018: Milk and milk products – yoghurt – JS 1841:2015 Milk and milk products – Whey Powders – JS 796:2014 Milk and milk products – Boiled white cheese – JS 4:2014 Milk and milk products – Raw Milk – JS 538:2014 Milk and milk products – Pasteurized Milk – JS 430:2010 Milk and milk products - Cream and prepared cream – JS 1748:2007 Milk and milk products - Code of hygienic practice for milk and its product – JS 108:2003 Milk and milk products – Labaneh – JS 288:2011. Foodstuffs – Shelf lives of foodstuffs.
<p>What are the proper pasteurization conditions of fresh milk?</p>	<p>Milk is properly pasteurized using the following temperature and time combination:</p> <ul style="list-style-type: none"> – 62.7 °C for 30 minutes – 71.6 °C for 15 minutes – 80–85 °C for 5 minutes <p>The higher-temperature, shorter-time pasteurization cannot be achieved using boiling pans so a plate heat exchanger is required.</p>

Question	Actions to take
<p>What type of tool do you use to pasteurize the milk?</p>	<ul style="list-style-type: none"> - If you are using stainless steel or aluminum pans placed directly over the heat source, you have to be careful of not burning the milk as it is sensitive to over-heating. - Make sure to control the temperature and stir milk thoroughly to avoid burning. Or you can use a jacketed stainless-steel boiling pan. Steam from a boiler heats the space between the outer jacket and inner pan to give more uniform heating and avoid burning.
<p>What are the proper conditions to pasteurize fresh milk for yoghurt production?</p> <p>Do you have a thermometer to major temperature in your working area?</p>	<p>Milk should be heated to 90-95°C for at least 10 minutes using the same pasteurization method mentioned above.</p>

Annex 4

Question	Actions to take																								
<p>Do you know the value and cost of having a good and accurate information system?</p>	<p>Value of having good information system:</p> <ul style="list-style-type: none"> - detailed knowledge about the production processes of your business - identification of trends - accurate control over finances and product quality - identification of individual costs to allow changes to a product or process to optimize profits - keeping track of money owed to the business <p>Cost of having good information system:</p> <ul style="list-style-type: none"> - time spent learning how to keep records - time spent writing the records - cost of materials such as notebook and pens <p>Workers should know the value of having accurate information system and why it is being collected.</p>																								
<p>Do you record the amount of raw materials and ingredients that are used in the production?</p>	<p>Records of the amount and quantity of raw materials and ingredients should be kept to ensure that the workers mix together the same quantity of raw materials and ingredients at each batch.</p> <p>The following table can be used to record the needed information:</p> <table border="1" data-bbox="619 1424 1339 1841"> <tr> <td colspan="3" data-bbox="619 1424 1339 1496">Product name:</td> </tr> <tr> <th data-bbox="619 1496 1005 1556">Raw material / ingredient</th> <th data-bbox="1005 1496 1155 1556">Batch number</th> <th data-bbox="1155 1496 1339 1556">Quantity (Kg) / volume (L)</th> </tr> <tr> <td data-bbox="619 1556 1005 1608"></td> <td data-bbox="1005 1556 1155 1608"></td> <td data-bbox="1155 1556 1339 1608"></td> </tr> <tr> <td data-bbox="619 1608 1005 1659"></td> <td data-bbox="1005 1608 1155 1659"></td> <td data-bbox="1155 1608 1339 1659"></td> </tr> <tr> <td data-bbox="619 1659 1005 1711"></td> <td data-bbox="1005 1659 1155 1711"></td> <td data-bbox="1155 1659 1339 1711"></td> </tr> <tr> <td data-bbox="619 1711 1005 1762"></td> <td data-bbox="1005 1711 1155 1762"></td> <td data-bbox="1155 1711 1339 1762"></td> </tr> <tr> <td data-bbox="619 1762 1005 1814"></td> <td data-bbox="1005 1762 1155 1814"></td> <td data-bbox="1155 1762 1339 1814"></td> </tr> <tr> <td data-bbox="619 1814 1005 1841"></td> <td data-bbox="1005 1814 1155 1841"></td> <td data-bbox="1155 1814 1339 1841"></td> </tr> </table>	Product name:			Raw material / ingredient	Batch number	Quantity (Kg) / volume (L)																		
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Question	Actions to take																																										
<p>Do you record the main processing conditions in the production process (i.e. time, temperature, etc.)?</p>	<p>Records to the main processing conditions should be kept to ensure that the workers process raw materials and ingredients according to the recipe and under the same processing conditions each time. The following table can be used to record the needed information:</p> <table border="1" data-bbox="622 488 1377 981"> <tr> <td colspan="5" data-bbox="622 488 1377 539">Product name: yoghurt</td> </tr> <tr> <td colspan="5" data-bbox="622 539 1377 591">Batch number: 02</td> </tr> <tr> <th data-bbox="622 591 786 736">Process</th> <th data-bbox="786 591 941 736">Parameter</th> <th data-bbox="941 591 1074 736">Target condition</th> <th data-bbox="1074 591 1198 736">Actual condition</th> <th data-bbox="1198 591 1377 736">Effect of the change from the target on the quality of final product</th> </tr> <tr> <td data-bbox="622 736 786 882" rowspan="2">Pasteurization of raw milk</td> <td data-bbox="786 736 941 788">Temperature</td> <td data-bbox="941 736 1074 788">62.7 ± 1 °C</td> <td data-bbox="1074 736 1198 788">63 °C</td> <td data-bbox="1198 736 1377 882" rowspan="2">Out of specification product - health and safety issues</td> </tr> <tr> <td data-bbox="786 788 941 882">Time</td> <td data-bbox="941 788 1074 882">30 ± 0.5 min</td> <td data-bbox="1074 788 1198 882">20 min</td> </tr> <tr> <td data-bbox="622 882 786 934"></td> <td data-bbox="786 882 941 934"></td> <td data-bbox="941 882 1074 934"></td> <td data-bbox="1074 882 1198 934"></td> <td data-bbox="1198 882 1377 934"></td> </tr> <tr> <td data-bbox="622 934 786 981"></td> <td data-bbox="786 934 941 981"></td> <td data-bbox="941 934 1074 981"></td> <td data-bbox="1074 934 1198 981"></td> <td data-bbox="1198 934 1377 981"></td> </tr> </table>	Product name: yoghurt					Batch number: 02					Process	Parameter	Target condition	Actual condition	Effect of the change from the target on the quality of final product	Pasteurization of raw milk	Temperature	62.7 ± 1 °C	63 °C	Out of specification product - health and safety issues	Time	30 ± 0.5 min	20 min																			
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<p>Do you record the daily cash used to buy raw materials, ingredients and packaging materials?</p>	<p>Record of the cash used to buy raw materials, ingredients and packaging materials should be kept. The following table can be used to record the needed information:</p> <table border="1" data-bbox="622 1182 1386 1626"> <thead> <tr> <th data-bbox="622 1182 708 1328">Date</th> <th data-bbox="708 1182 882 1328">Item (raw material, ingredient or packaging material)</th> <th data-bbox="882 1182 1013 1328">Supplier</th> <th data-bbox="1013 1182 1169 1328">Quantity (Kg) / volume (L)</th> <th data-bbox="1169 1182 1281 1328">Quality*</th> <th data-bbox="1281 1182 1386 1328">Cash out (JD)</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table> <p data-bbox="622 1626 1013 1653">* determined after inspection upon arrival</p> <p data-bbox="622 1671 1386 1877">Having records for the purchased raw materials, ingredients and packaging materials over a specific period of time would help you to manage and plan your inventory. As you are working in a micro scale, there is no need to buy materials in bulks, as holding them for a long period of time may results in spoilage and it would increase the cost of production.</p>	Date	Item (raw material, ingredient or packaging material)	Supplier	Quantity (Kg) / volume (L)	Quality*	Cash out (JD)																																				
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<p>Do you keep record for your daily sales?</p>	<p>Record of the daily cash that comes into your business should be kept. The following table can be used to record the needed information:</p> <table border="1" data-bbox="624 416 1337 775"> <thead> <tr> <th>Date</th> <th>Product</th> <th>Quantity sold (Kg, bag, jar, etc.)</th> <th>Cash in (JD)</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table> <p>When you have records for the daily sales, this would help you to find out whether demand for a certain product is increasing or decreasing. Accordingly, you can draw up future plans to cope with the expected changes in demand.</p>	Date	Product	Quantity sold (Kg, bag, jar, etc.)	Cash in (JD)																																																				
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<p>Do you know how to calculate your profit or loss?</p>	<p>Profit and loss describe how money comes into and leaves your business during a specific period of time. This allows you to have an indication about the progress of your business and compare your trend with other months. The following table can be used to record the needed information:</p> <table border="1" data-bbox="624 1227 1386 1861"> <thead> <tr> <th colspan="4">Period: month, week, etc.</th> </tr> <tr> <th colspan="4">Product:</th> </tr> <tr> <th>No.</th> <th>Item</th> <th>In (JD)</th> <th>Out (JD)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Income from sales</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>Purchases of raw materials, ingredients and packaging materials</td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>Salaries</td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>Rental costs</td> <td></td> <td></td> </tr> <tr> <td>5</td> <td>Transportation</td> <td></td> <td></td> </tr> <tr> <td>6</td> <td>Electricity/fuel cost</td> <td></td> <td></td> </tr> <tr> <td>7</td> <td>Water cost</td> <td></td> <td></td> </tr> <tr> <td>8</td> <td>Any other costs (expired raw materials or products)</td> <td></td> <td></td> </tr> <tr> <td>9</td> <td>Gross profit (JD)</td> <td>= item No. 1</td> <td></td> </tr> <tr> <td>10</td> <td>Total expenses (JD)</td> <td></td> <td>=∑ item 2-8</td> </tr> <tr> <td>11</td> <td>Net profit/loss (JD)</td> <td>= item No. 9 – item No. 10</td> <td></td> </tr> </tbody> </table>	Period: month, week, etc.				Product:				No.	Item	In (JD)	Out (JD)	1	Income from sales			2	Purchases of raw materials, ingredients and packaging materials			3	Salaries			4	Rental costs			5	Transportation			6	Electricity/fuel cost			7	Water cost			8	Any other costs (expired raw materials or products)			9	Gross profit (JD)	= item No. 1		10	Total expenses (JD)		=∑ item 2-8	11	Net profit/loss (JD)	= item No. 9 – item No. 10	
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Question	Actions to take																								
<p>Do you know how to calculate your weekly or monthly production rate?</p>	<p>The production rate is calculated as follows:</p> $\text{Production rate (kg or litres/day)} = \frac{\text{amount of product sold per week or month (kg or litres)}}{\text{Number of working days per week or month}}$ <p>The number of working hours per day or the number of working days per week or month should be recorded.</p> <p>Example:</p> <p>Your monthly sales are 50 Kg pickles, assuming that production takes place for 8 hours each day for 20 days per month, then the daily production rate will be:</p> $\text{Production rate } \left(\frac{\text{Kg}}{\text{day}}\right) = \frac{50 \text{ Kg}}{20 \text{ day}} = 2.5 \text{ Kg/day}$																								
<p>Do you know how to do a comparative report for you monthly consumptions and sales?</p>	<p>A comparative monthly report is used to compare the current month's results with the previous months. According to the results of comparison, the business owner can decide if the operation is under control. The following table can be used to compare the results between the months:</p> <table border="1" data-bbox="619 1176 1385 1646"> <thead> <tr> <th colspan="3" data-bbox="619 1176 1385 1232">Product name:</th> </tr> <tr> <th data-bbox="619 1232 815 1321">Month</th> <th data-bbox="815 1232 1126 1321">Monthly consumption (JD) (raw material, ingredients or packaging materials)</th> <th data-bbox="1126 1232 1385 1321">Monthly sales (JD)</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	Product name:			Month	Monthly consumption (JD) (raw material, ingredients or packaging materials)	Monthly sales (JD)																		
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Question	Actions to take
<p>Do you know how to monitor and improve your business productivity?</p>	<p>In order to assess whether your production process needs specific improvement measures and options, it is necessary to record the consumption of resources (main or essential raw material, main or essential ingredients, packaging materials, water and energy) and waste. These figures can be used to calculate a baseline for the following indicators:</p> <ul style="list-style-type: none"> – Material / ingredient use indicator: actual consumption; not the amount planned to be used in the recipe but the actual amount used during production; of raw materials and ingredients per unit of product. – Water use indicator: total volume of water used per unit of product – Energy use indicator: total energy (kWh or MJ) used per unit of product – Generated waste indicator: total amount of waste (ton) produced per unit of product <p>After establishing the baseline, your performance could be evaluated at different points in time, by comparing the baseline after implementing any measures and options for improvement with the first baseline before applying the options. Or by comparing the actual consumption of material/ingredient per unit product with the ideal amount of material/ingredient described in the recipe, the ideal consumption is what your consumption would be if you process the raw materials and ingredients with no waste. This number will give you a target value that could help you to reduce waste and prevent losses. The closer your ideal and actual consumptions are, the more profitable your business.</p>

Annex 5

Question	Actions to take
<p>Do you primarily use water for cleaning (floor, kitchen's tools and equipment) in your business? How do you control the water consumption during the cleaning process?</p>	<ul style="list-style-type: none"> – Excess water use incurs not only unnecessary high water cost, but also energy cost for pumping and the environmental impact associated to the energy consumption. Excess use of water could lessen your access to water, especially if the source of water is limited. – Implement dry cleanup (sweep the floor or wipe the kitchen's tools and equipment) before washing with water. This action reduces the amount of water required to remove solid wastes. – Sterilize glass jars in an oven at 100°C for 10-15 minutes instead of soaking them in boiled water for a similar time. – Use hot water to clean oily surfaces. – Use low-volume and high- pressure water, this action involves only adding a new nozzle to the end of the hose or water tap. – Make sure that water taps are in good working conditions and there is no spillage and leakage. – Monitor water tanks and prevent spillage. – Turn off the water when not in use. – Instruct the workers to reduce the water consumption as much as possible.
<p>In which production steps do you use water? And what are the measures you implement to reduce the water consumption?</p>	<ul style="list-style-type: none"> – Remove solid materials manually before washing raw materials with water. – Use of air cooling instead of water cooling. – Cooling water can be used for irrigation, preliminary wash of raw materials and in floor cleanup operation. – Avoid continuous rinsing with water and check the possibility of rinsing in still baths. – Use low-volume and high- pressure water, this action involves only adding a new nozzle to the end of the hose or water tap. – Make sure that water taps are in good working conditions and there is no spillage and leakage. – Turn off the water when not in use. – Instruct the workers to reduce the water consumption for the cleaning of raw materials as much as possible (e. g. by washing in containers / bowls and closing the water taps immediately after use).

Annex 6



Question	Actions to take
<p>Do you monitor the monthly consumption of primary raw materials (milk) and ingredients (salt, ripening culture, etc.)?</p>	<p>Keep good records (quality, quantity and cost) of consumed primary raw materials and ingredients to help you:</p> <ul style="list-style-type: none"> – Determine your consumption per batch and hence determine the sources and causes of losses (human error, low quality inputs, etc.) if occurred. – Detailed knowledge about the operation and trend of your business help you to take the needed corrective actions for unnecessary losses.
<p>Do you test the raw milk to check its quantity and quality before receiving it?</p> <p>Do you keep a record for your invoices with your supplier's name?</p>	<p>It is important to weigh the quantity of received milk, and measure its pH before accepting it. Monitor and qualify the performance of the supplier(s) to be accredited or changed.</p>

Question	Actions to take
<p>Do you have detailed written recipe for each product that the workers shall follow it?</p> <p>Do you have working sheets for workers?</p>	<p>Having detailed written recipe (type and amounts of the ingredients, required tools (i.e. calibrated cups and spoons, balance, etc.)) is critical to both the quality of the final product and the financial viability of your business and it enables uniform products to be made in every batch and avoids wastage of primary raw materials and ingredients.</p> <p>Staff should be well trained and aware of the processing conditions (temperature, time, acidity, texture, etc.) to achieve high quality and uniform final product.</p> <p>Highly recommended to attend a training course in dairy processing.</p>
<p>Do you evaluate and record waste quantities of the final products?</p>	<p>Record the waste volumes in the final product will help you to identify the problems (low quality inputs, human error, safety issues, lack of knowledge of food hygiene, improper food processing, etc.) and to take the needed corrective actions. The following actions could reduce the losses in the final product:</p> <ul style="list-style-type: none"> – Check the quality of primary raw milk and check the possibility of having it from a nearby source. This will reduce the cost of transportation and the risk of spoil of raw milk. – Do simple tests to investigate the quality of received raw milk. – Check the quality of water. More details are given in General personal hygiene & food safety. – Check the storage conditions. More details given in General personal hygiene & food safety. – Attend training courses on food safety and dairy processing.

Annex 7

Question	Actions to take
Do you monitor the monthly electricity bills and the monthly LPG bottles changes?	Keep good records (quantity and cost) of consumed electricity and LPG to help you: <ul style="list-style-type: none"> – Determine your consumption per production unit or per consumed raw milk and hence determine the sources and causes of energy wastes if occurred. – Help you to take the needed corrective actions for energy waste reduction.
When you leave your workday or break, do you leave electrical equipment or appliances on?	<ul style="list-style-type: none"> – Make sure that all equipment are turned-off except these necessary to be kept on (Like refrigerators).
Do you turn off the lights you are not occupying?	<ul style="list-style-type: none"> – Make sure that all lights are turned-off except in the occupied areas.
Check if your lighting tubes are with “LED” type or not by doing the following quick test: <ol style="list-style-type: none"> 1. Turn off the light. 2. Turn on the light. 3. Note the fast response and stability of the light or not. 	<ul style="list-style-type: none"> – The fast light response indicates that the existing lighting tube is with LED type, which is the best case. – In case of slow response of the light, it indicates that the existing lighting tube is with fluorescent type, which consumed more than LED type and has lower lifetime (it is recommended to replace it with LED tube). – Make sure that all lighting units used are with LED type.
What is the full capacity of the existing cookers? How much cooking times the cooker used daily?	<ul style="list-style-type: none"> – Using large cooker is more efficient for large amount of raw materials used, which reduce the cooking times needed and reduce the waste heat.
Do you check if the gas cooker’s eyes are always clean?	<ul style="list-style-type: none"> – Any clogging in the gas cooker eyes will cause inefficient firing and increase energy waste.

Question	Actions to take
What is the age of used refrigerator? Check if it has an energy label.	– New efficient refrigerator is recommended with energy labeling.
Check if the refrigerator is located near to heating sources (gas cooker, direct sun radiation, etc.)	– Make sure that the location of the refrigerator should be far away from any heating source and keeping 30 cm space between the wall and the back of the refrigerator to insure good heat exchange.
Do you have solar water heating system?	– The use of solar water heating system reduces the consumption of electricity and fuel to produce hot water such that needed for cleaning.

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