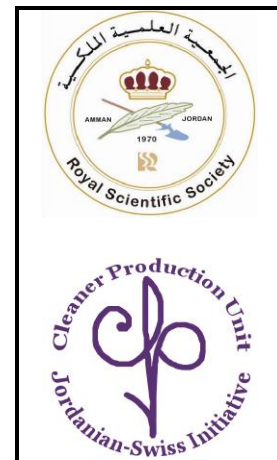


# Cleaner Production in Jordan

## Fact Sheet: Dairy Plants Amman, Jordan



### What is Cleaner Production?

Cleaner Production (CP) is the continuous application of an integrated and preventive strategy to processes, products and services to increase efficiency and reduce risks to humans and the environment.

In this fact sheet, the results achieved from conducting the CP QuickScan+ on ten small and medium size dairy plants are summarized. The information shall serve to demonstrate how CP can be implemented in dairy plants in Jordan.

### RSS-IRADA project

Based on an agreement between the Enhanced Productivity Centers (IRADA) and the Cleaner Production Unit of the Royal Scientific Society (CPU / RSS) the QuickScan+ methodology has been applied on ten small and medium sized dairy plants distributed in different governorates of Jordan.



The aim of the project was to raise awareness about CP and thus to motivate the companies to rationalize their production process in order to reduce the consumption of raw materials, energy and water, but also to utilize whey as a valuable raw material instead of draining it off as waste. This will lead to improving the eco-efficiency of the plants, their image and position in the market as well as their environmental and economic performance.

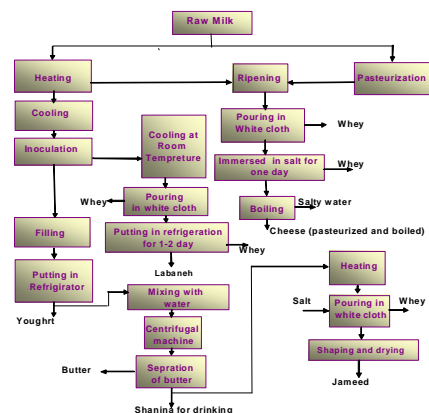
In practical, the production sections were assessed on CP potentials and specific recommendations were given individually to the ten dairy plants. In a second step, an in-depth training was held for the interested managers with the main objective to build up further capacity about Good Operation Practices, hygienic concepts and best suitable production techniques for village dairies in Jordan. The training was tailored to the requirements of the Jordanian dairies with focus on yoghurt and cheese production as well as the utilization of whey.

### General Information



Companies	Ten different small and medium sized dairy plants in Jordan
Sector	Food industry
Products	Yoghurt, <i>labaneh</i> (hard yoghurt), cheese (pasteurized and boiled), <i>shanineh</i> , butter and <i>jameed</i>
Market	Local market
Employees	From 2 to 120 per company

### Production



Processes	Raw milk receiving, pasteurization (heating, cooling), inoculation, incubation (yoghurt and <i>labaneh</i> production). Raw milk receiving, pasteurization or heating, ripening, pressing, salting, boiling (cheese production), see flow chart.
Raw Materials	Sheep milk, cow milk, rennet powder, water, calcium carbonate and salt. The capacity of the companies ranges from 200 l/day up to 35 m <sup>3</sup> /day milk intake.
Energy Sources	Electricity, diesel and LPG.
Wastes and Emissions	Wastewater (whey) and solid wastes (plastic, empty cans, etc.)

## Results



Many CP options have been identified for each of the dairy plants. Following are the expected benefits from the implementation of the CP options:

- § Reduction of manufacturing costs.
- § Improving hygienic conditions.
- § Product quality improvement.
- § Reduction of environmental impacts.

Following are some suggested CP and Good Housekeeping options:

Option	Environmental domain
Option 1: Utilize the whey residue as drink, as animal feed, for irrigation and/or to produce other side products like some kind of cheese or sorbets instead of draining-off the whey as waste. This will reduce greatly the effluent load and thus the environmental impact and gives the opportunity to sell further products.	Waste water (reduction of BOD <sub>5</sub> load)
Option 2: Improve the insulation of boiler and hot pipes in order to save energy.	Fuel oil saving (reduction of air pollutant emissions)
Option 3: Use simple clean in-place system by recycling the last rinsing water from cleaning the equipment as first flush of the next rinsing cycle in order to reduce water consumption. Also reuse the cleaning acids and soda for more than one time to reduce cost and wastewater load.	Water savings and waste water reduction
Option 4: Install a pressure gun to the hose for manual cleaning to reduce water consumption.	Water savings and waste water reduction
Option 5: Avoid putting the products directly on the floor of the refrigerator (use plastic/ wooden pallets) in order to reduce the risk of contaminating the products.	Hygiene and product quality improvements
Option 6: Do not store chemicals (e.g. soda and acids) in the production hall to reduce the risk of accidents.	Hygiene and accident prevention
Option 7: Install or repair the automatic temperature controllers for the plate heat exchangers of the pasteurizers in order to improve process control and thus equalize the product quality.	Energy saving and product quality improvements
Option 8: Improve milk testing techniques e.g. using acidity test instead of measuring the pH and using blue methylene test for bacterial count. This will reduce the risk of low milk quality intake and thus improve product quality.	Product quality improvement
Option 9: Improve work hygiene by using hand washer with touch-less taps, soap and disposable paper at the entrance of the production zone, using proper closed footwear, hair cover, and clean and organized cloakroom.	Hygiene and product quality improvements

## Contacts & Partners



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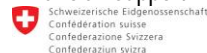


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