

# MED TEST III Jordan

Transfer of Environmentally Sound Technologies

Food and beverage sector

*Siniora Food Industries Company*

## Company overview

### Number of employees:

602 full-time employees

### Key products:

Mortadella, Roast, Slices, Sausage, Cans, Frozen

### Main markets:

Local (70%), International (30%)

### Standards & certifications before MED TEST III:

ISO 22000, ISO 9001, ISO 14001, HACCP, FSSC 22000  
ISO 27001, ISO45001

In operation since 1920, the Siniora Company has a well-established brand, and the factory in Sahab, Jordan, was established under the name of Siniora Food Industries. Today, Siniora produces around 162 products. In 2015, production lines were upgraded to include frozen foods, which complement the company's large assortment of cold cuts and canned meat, including mortadella, roasted meats, luncheon meats, salami, sausages, canned meats, burgers, escallops, spiced fillets, pastries and kubbeh.

## Benefits

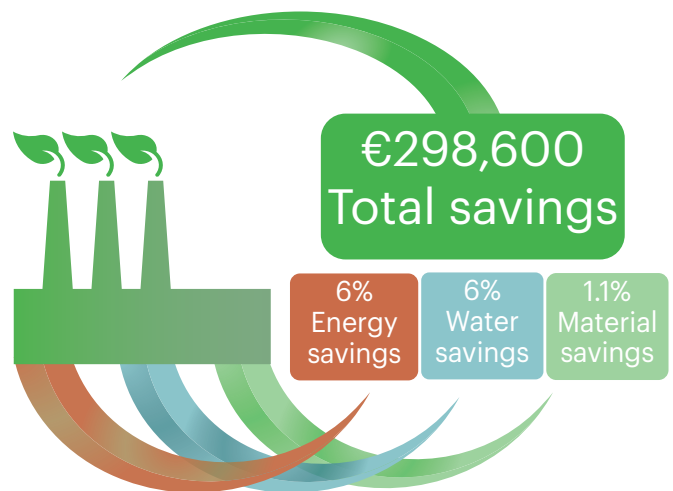
The MED TEST III project identified a total of 14 measures, for energy and materials conservation. Nine of the defined options are low-cost opportunities (600 – 20,000 JOD), saving in total around 15,000 JOD per year.

In the five medium/high investment opportunities, the cost of implementation ranges between (30,000 –106,000 JOD), saving the company around 200,000 JOD/year. All these measures are expected to reduce carbon emissions by 196 tons/ Year.

The MED TEST III project identified total annual savings of 298,600 Euro\* (223,950 JOD) with an estimated investment of 410,400 Euro\* (307,800 JOD.) The average payback period of the identified measures is 1.4 years. None of the identified measures has been rejected, however all of them are retained for further study. Materials consumption will be reduced by 1.1%, energy consumption by approximately 6%, and water consumption will be reduced by 6%. Additionally, CO<sub>2</sub> emissions will be reduced by 5%.

The culture within the company has migrated towards more cross-departmental boundary collaboration as it became evident that no project would be complete without this change. The focus on data from the accounting department Material Flow Cost Accounting (MFCA) values, even after multiple iterations, was necessary to ensure the best data quality and understanding of the MFCA concept.

## Identified annual savings



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Capitalizing on the previous success of Siniora Palestine in adopting the TEST approach, Siniora Jordan decided to introduce the same principles aiming at optimizing processes and minimizing operational waste including water, wastewater and energy.

Eng. Yusra Salhab  
Quality Assurance Manager and team leader

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As part of the EU-funded SwitchMed programme, UNIDO demonstrates in the MED TEST III project pathways for industries in the Southern Mediterranean to become more resource efficient and to generate savings for improved competitiveness and environmental performance.

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## Saving opportunities\*\*

Actions	Economic key figures			Resource savings & Environmental impacts		
	Investment Euro*	Savings Euro* per year	Payback period years	Water & Materials per year	Energy MWh per year	Environmental impact per year
Raw materials, water and product recovery	184,000	242,400	0.8	82.5 tons 4,790 m <sup>3</sup> water	58	196 tons CO <sub>2</sub> -eq.  49.5 tons of solid waste
Heat conservation	185,600	38,734	4.8	-	455	
Cooling system	40,800	17,466	2.4		151	
<b>Total</b>	<b>410,400</b>	<b>298,600</b>	<b>1.4</b>	<b>82.5 tons 4,790 m<sup>3</sup> water</b>	<b>666</b>	

\*Exchange rate 0.75 Jordanian Dinar (JOD) = 1 Euro  
\*\* Numbers based on production value from 2020

### Raw materials, water and product recovery

Several options could minimize raw materials, products and waste losses. A major option would be to switch from the thawing process to a microwave technology. The current thawing stage consumes a lot of water (3 m<sup>3</sup>/day), energy (200 KWh per defrost cycle), and, most importantly, the company losses 5% of raw material weight in the drip water: switching to microwave technology will contribute to saving around 150,000 JOD of raw material value. The company will also save the needed space for the thawing and reduce the processing time from 9 hrs to 2.5 – 5hrs max with an increase in productivity. Moreover, it is estimated to save around 9,500 JOD in energy costs with an estimated reduction of CO<sub>2</sub> emissions of about 27.3 tons per year.

Another eco-innovative opportunity is to upcycle the generated meat waste as animal feed. The practice where meat waste is daily landfilled contributes to the generation of Greenhouse Gas (GHG) emissions, which may range from (20 – 40 Kg CO<sub>2</sub> eq/ Kg of beef) in addition to the bad smells and other environmental impacts. Using a special kind of earthworm called (black soldier) to convert meat waste into animal feed and as a new source of dietary protein for the animal industry is expected to save around 20,250 JOD / Year (assuming a selling price of 1 ton on animal feed= 450 JOD). This measure will also reduce GHG emissions by 170 tons of CO<sub>2</sub>-eq annually.

### Heat conservation

The steam network efficiency measures will lead to around 60% of the energy savings with a reasonable payback period below 4.8 years. Measures include the usage of a heat recovery economizer, steam trap monitoring and network pressure segregation. This group of measures would also positively impact product quality, given the higher expected homogeneity of cooking heat within the oven chamber. Installing external oven compartment dedicated for cooling of product and not inside the oven's chamber will also eliminate a bottleneck in the production process, and freeing up oven lines for more batches instead of being partially dedicated to longer cooling times.

The redundancy created by supplying a secondary boiler with a lower pressure point for most demand points helps mitigate stoppage risk and reduce unnecessary high-pressure consumption.

### Cooling system

The energy savings are linked to reducing the cooling loads derived from the chilled water system. The measures optimize the energy users demand, such as cool air suction hood recovery post-filtering and switching to better technologies in terms of monitoring, especially for cold room SCADA system alarms. Also, as mentioned earlier, the change to microwave alternatives in the thawing process can accelerate reaching of temperature targets in a controlled manner while maintaining better product quality.

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The project analysis and study was an opportunity to know more about global best practices related to fields under study and to compare with similar industries.

Eng. Yusra Salhab

Quality Assurance Manager and team leader

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## For more information contact:



UNITED NATIONS  
INDUSTRIAL DEVELOPMENT ORGANIZATION

United Nations Industrial Development Organization  
Ms. Ulvinur Müge Dolun  
Division of Circular Economy and Environmental Protection  
Circular Economy and Resource Efficiency Unit  
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria  
E-mail: u.dolun@unido.org Web: www.unido.org



الجمعية العلمية الملكية  
Royal Scientific Society

Royal Scientific Society  
Ms. Jehan Haddad  
Water, Environment and Climate Change Centre  
Cleaner Production Unit  
PO Box 1438, 11941 Amman-Jordan  
E-mail: jehan.haddad@rss.jo Web: www.rss.jo