S23.23_Hilali
m.hilali@cgiar.org

Improving value addition: simple technological changes in the processing of milk in northern Syria

M. Hilali[1], L. Iñiguez[1] and M. Zaklouta[1], [1]International Center for Agricultural Research in Dry Areas (ICARDA), P.O. Box 5466, Aleppo, Syria

Abstract

Set type sheep milk yogurt is a highly demanded product in Syria and its production increased from 59 to 91 thousand ton during 1999-2003. Furthermore, it contributes progressively more to the economy of dairy sheep producers. This is the case of El-Bab region in northern Syria, where 50-60% of the farmer's income derives from yogurt and cheese production. In general yogurt prices are affected by taste and texture and the main marketing constraints identified by farmers are sourness and weak texture caused by processing failures. To solve firmness problems that affect the transportability of the products, three commercial starters were tested with farmers: Very mild flavour, high viscosity (VMF-HV), mild flavour, high viscosity (MF-MV) and strong flavour, medium to low viscosity (SF-L to MV). Yogurts made with these cultures using Awassi sheep milk were compared with the farmers' traditional yogurt as control. The different yogurts were evaluated at the market for price differences. Yogurt made using (VMF-HV) was sold 2 SL/kg less compared with control, however yogurt elaborated with (MF-MV) and (SF-L to MV) were paid 2 SL and 5 SL more that the control. Viscosities of (SF-L to MV) yogurt and (MF-MV) yogurt were 60.2% and 71.6% respectively higher than the control. Furthermore regarding to firmness (SF-L to MV) yogurt and (MF-MV) yogurt were 29.9% and 19.7 stronger than the control.

Introduction

Yogurt is widely consumed in West Asia, directly or as a component of the local cuisine. In Syria, most of the yogurt is produced by resource-poor farmers. This is the case of dairy sheep production systems in El-Bab area of Syria, where milk production provides 48% of farmers' income.

In a community-based participatory research in this area, ICARDA tested simple technologies to improve milk processing and yogurt production. This report presents a summary of the findings.

Methods

Selection of project communities

Two communities, Abu-Jabar and Bugaz, in El-Bab area of northern Syria were selected for the project. Farmers in the communities engage in sedentary and semi-intensive crop-livestock production systems that produce yogurt and cheese.

Assessment of local knowledge

- Participatory workshops were conducted in both communities to assess the local knowledge and identify major constraints to yogurt production. Separate workshops were held for both the male and female farmers because only the women collect and process dairy products.
- Training workshops were then held to educate farmers on the basics of hygienic milk management and improved yogurt processing.

Testing of new starters for better transportability

To beat transportation problems caused by low firmness, three starters that produce firm yogurt were tested against the ones used traditionally by the farmers. The three starters had very mild flavor with high viscosity (VMF-HV), mild flavor with medium viscosity (MF-MV), and strong flavor with medium to low viscosity (SF-L to MV).

- The viscosity of the processed yogurts was measured by using a viscosity meter after mechanically shaking the yogurt for 15 minutes.
- The firmness was measured with a texture analyzer, using a 20 mm cylinder probe to penetrate the yogurt mass for 25 mm.

Farmers then evaluated the yogurt produced within their households and in the market.

Results

Traditional yogurt processing

Milk is collected using traditional procedures, filtered, and processed. The milk obtained the previous night and kept without cooling is mixed with the milk obtained the following morning to produce yogurt. It is boiled in a pot for five minutes and transferred to three-liter buckets, allowing a foam layer to be formed on the top. This foam layer is referred to as the *face* of the yogurt, which is very important in its marketing. The milk is then left to cool while the temperature is checked with the thumb. As the milk reaches the "proper" temperature, it is inoculated with a starter obtained a day before (about 100 g per bucket). The inoculation is usually done from one side to prevent *face* damage. The buckets are incubated by covering them with blankets for 3–4.5 hours, depending on the weather. After this, they are uncovered and cooled, and the yogurt is sent to the market. This process produces a type of yogurt with thick *face* (Figure 1).

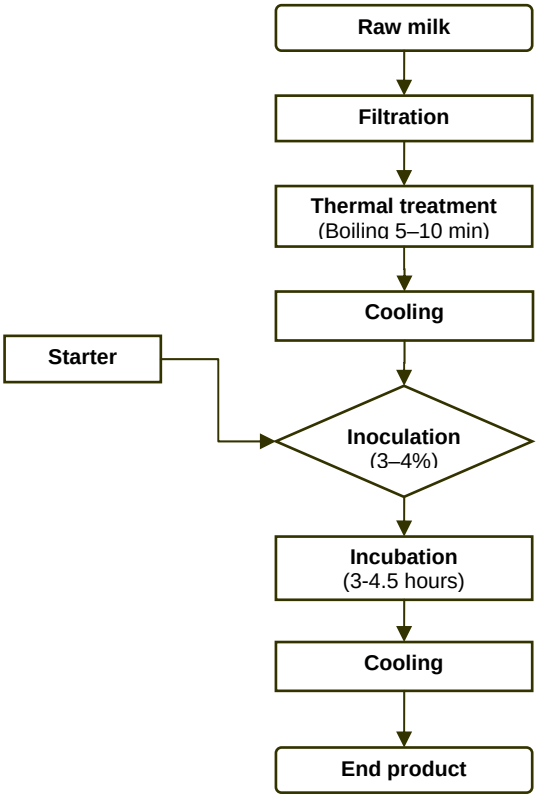

Figure 1. Traditional yogurt processing

Main constraints

- The traditional method of yogurt processing is prone to heavy contamination. The major constraints reported by farmers include sourness, weak texture, crumbling, and yeast flavor, which lower the market value.
- They also reported lack of firmness, which causes the yogurt to collapse when transported through the bumpy roads.

Intervention to improve yogurt transportability and flavor

The traditionally produced yogurt had a very low viscosity, but this was increased by 60–72% when the new starters were used. Similarly, they were 20–30% firmer and could be transported without collapsing (Table 1).

Table 1. Yogurt viscosity and firmness after shaking for 15 minutes.

Starter type	Viscosity (CP)	Firmness (g)
Local yogurt	201×10^3	63.3
Mild flavor medium viscosity (MF-MV)	345×10^3	75.8
Strong flavor medium-low viscosity (SF-M to LV)	322×10^3	82.2

The children preferred yogurt produced with the new starters, which had mild and very mild flavors, whereas adults preferred the traditional and strong-flavored yogurt.

However, there was a net increase in income by 18% from yogurt made with the new starters. The highest market price was obtained from (SF-M to LV) yogurt (30 SP/kg), followed by (MF-MV) (27 SP/kg) and the traditional (25 SP/kg) yogurt. (VMF-HV) yogurt had the lowest price of 22 SP/kg[1]. The difference in price was sufficient to cover the transportation cost of 5 SP per bucket of yogurt (Figure 2).

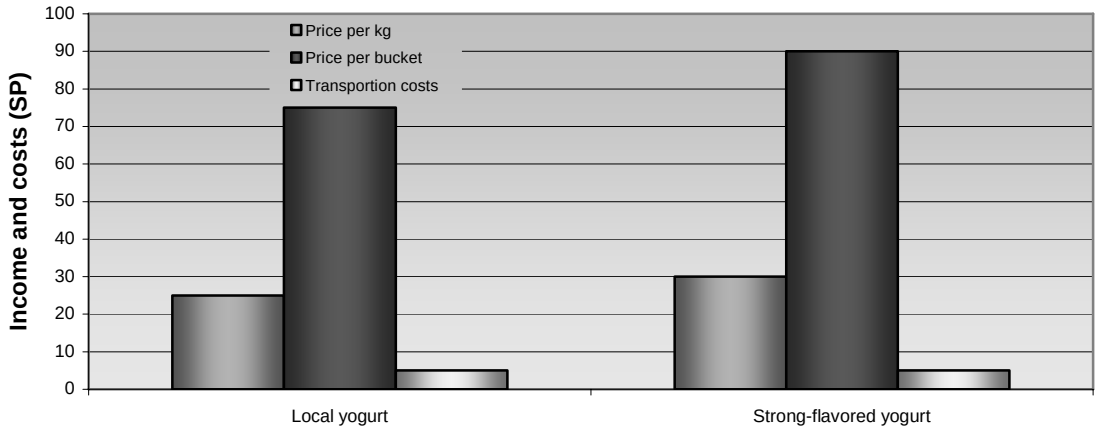

Figure 2: Income and transportation costs for local and strong flavored yogurt

Conclusions

- Participatory methods and market evaluation are key elements in technology testing. It enabled farmers in Bugaz to agree to use new starters to improve the quality of their yogurt.
- Often simple technologies are needed for farmers to improve productivity and income with regard to milk processing. The use of new starters solved problems confronted by farmers and increased their income in 18%.

[1] 1US$≈50 Syrian Pounds (SP).