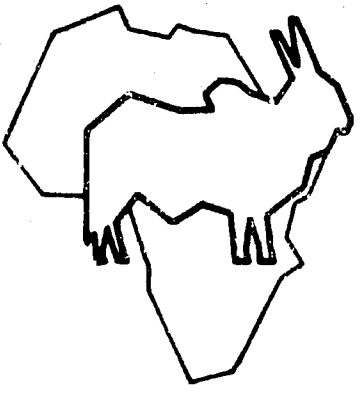
The ILCA internal agitator – increasing the efficiency of traditional buttermaking



International Livestock Centre for Africa (ILCA)
Addis Ababa, Ethiopia

The ILCA internal agitator — increasing the efficiency of traditional buttermaking

Improved "traditional" buttermaking: *Collect 6 to 8 litres of milk over several days. Allow the milk to sour. Cool to 18°C or less and churn in a traditional clay pot fitted with the ILCA internal agitator.*

The traditional method of making butter used in many parts of sub-Saharan Africa is slow and inefficient. Churning 6 litres of sour milk for two hours or more produces only 250 grams of butter. More than half the butterfat in the milk can be "lost" in the buttermilk if the milk is churned warm.

ILCA has developed a paddle-wheel agitator that fits inside the traditional clay pot. Using this internal agitator cuts churning time in half and increases recovery of butterfat as butter. In on-farm trials in Debre Birhan, in the Ethiopian highlands, churning time was reduced from an average of over two hours to less than one hour, while butterfat recovery increased from 71% to 93%.

Churning warm milk drastically reduces butter yield. In ILCA trials, increasing the temperature of the milk from 18°C to 25°C reduced butterfat recovery by a third (from 67% to 44% using the traditional churn and from 76% to 55% using the internal agitator).

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Making the ILCA internal agitator

Figure 1 shows the "improved traditional churn" ready for churning. Figures 2 and 3 show the components needed to make the improved churn.

Key to the Figures

A Wooden stopper

This fits into the mouth of the clay pot. It holds the internal agitator in position and prevents spillage of milk during churning.

B Clay pot

The body of the churn is a clay pot or gourd. The size of the container will vary with the amount of milk available, but generally should have a total capacity of at least 12 to 15 litres. For churning, however, the container should not be more than half full.

C Padded pot seat

This may be made of cloth or woven hay or straw. It reduces the risk of damage to the clay pot.

D Wooden pole and pegs

The supporting pole is made from one piece of wood and is about 1.5 metres long and 55 mm in diameter. The base of the pole is fixed rigidly by sinking it about 40 cm into the ground. Several holes are bored through the upper part of the pole about 3 cm apart; these are used for mounting the braces that connect the supporting pole to the shaft of the agitator.

E Wooden brace

Two wooden braces are used to connect the supporting pole (D) to the shaft of the internal agitator. These braces are flat pieces of wood, about 42 cm long, 10 cm wide and 15 mm thick. The braces should be placed about 20 cm apart on the supporting pole and locked in place with wooden pegs inserted through the holes in the supporting pole. If you need greater rigidity, use four wooden pegs, one on either side of each brace.

F Internal agitator with paddle blades

This consists of three main components: the shaft and two paddle blades. The shaft of the agitator is made from one piece of wood about 34 mm in diameter and 70 cm long. The paddle blades, each about 13.5 cm long, mount in a slot in the base of the shaft. The paddle blades are kept in position by a wooden plug (dowel). When the agitator is not in use the paddle blades hang vertically, enabling the agitator to be placed in the clay pot.

G Rope and handles

The rope, about 1.6 metres long, is passed through a hole in the upper part of the agitator shaft. About half the rope is wound around the shaft and the ends of the rope are tied to wooden handles. Pulling on the handles turns the shaft of the agitator. As the shaft turns, the paddle blades rise to their horizontal, working position.

Figure I.

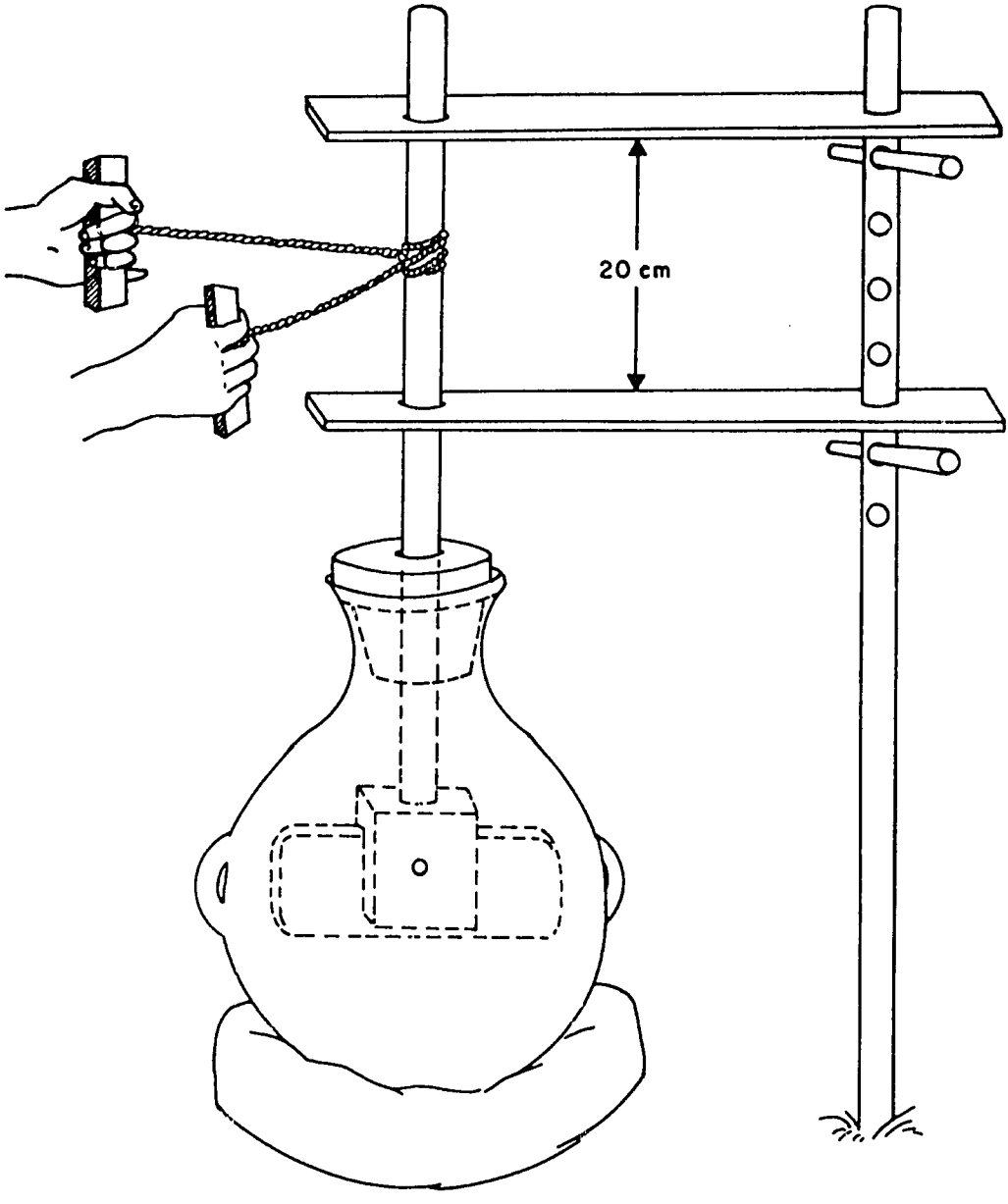
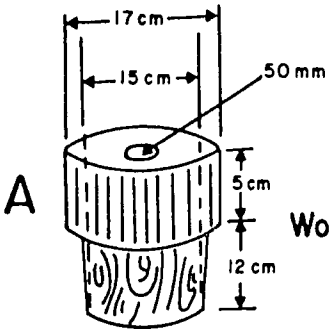
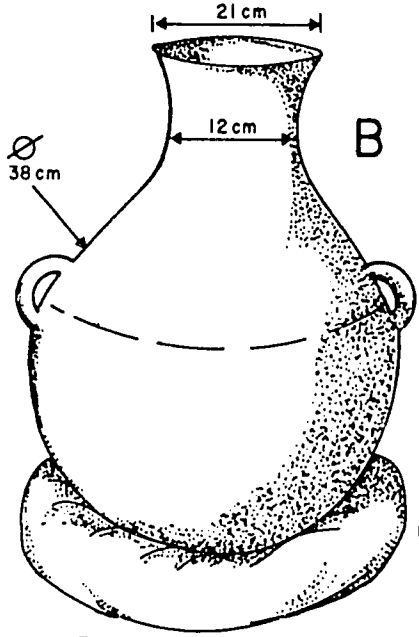


Figure 2.

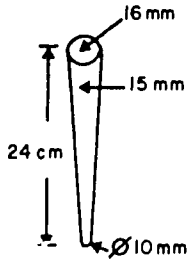


A Wooden stopper

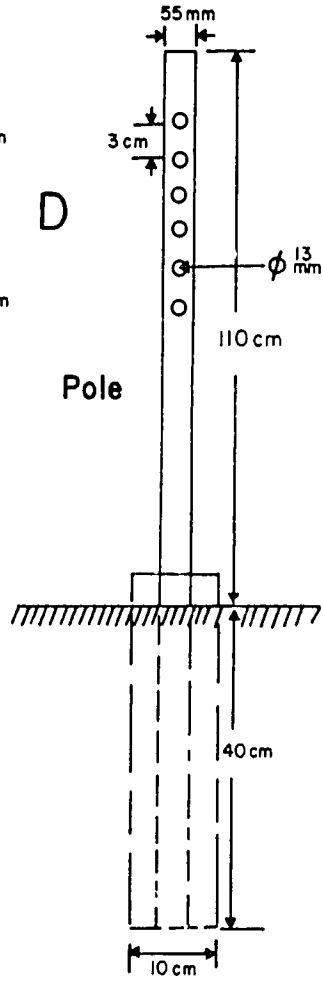


B Clay pot

C Padded pot seat

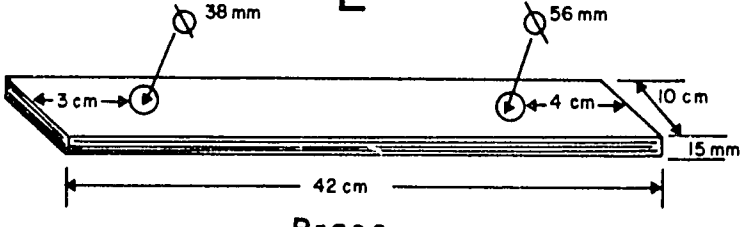


D



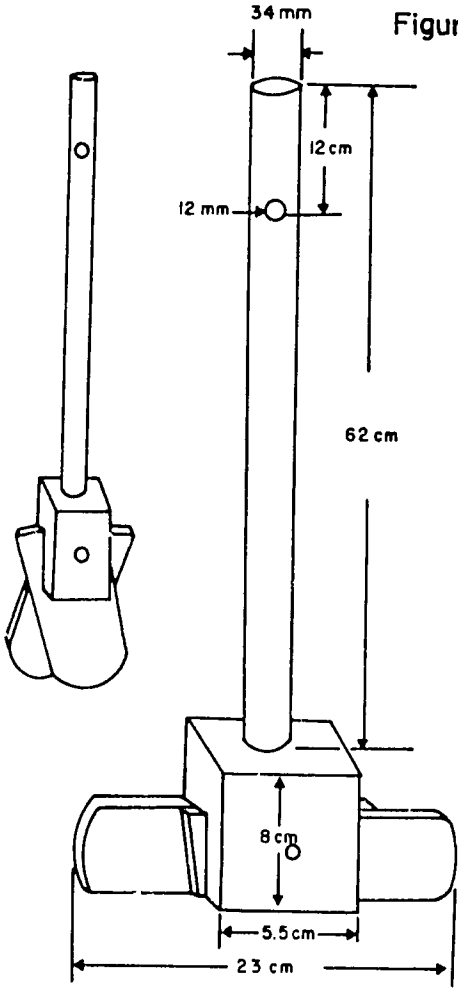
Pole

E



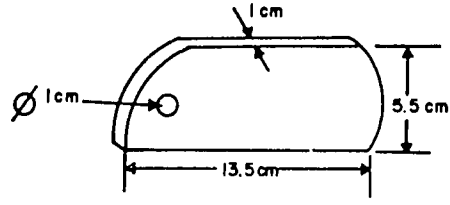
Brace

Figure 3.

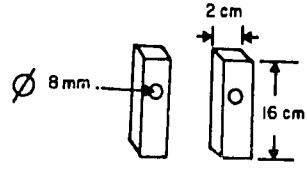


Agitator

F

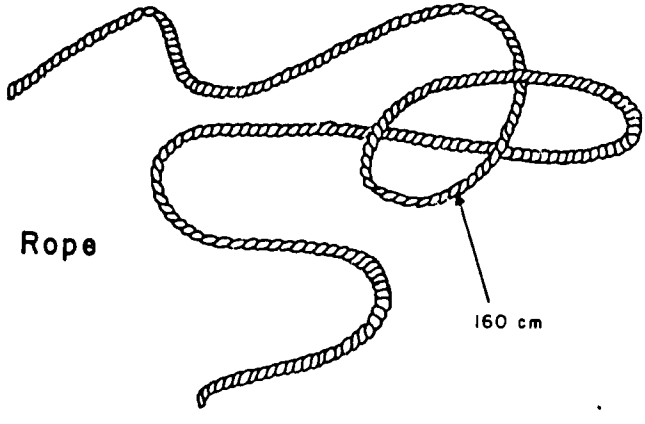


Paddle blade



Wooden handle

G



Rope