Application of the Passive Cold Chain Solution for Milk Preservation and Transportation in sub-Saharan Africa

Asaah Ndambi, Lotte Staelens, Zelalem Yilma, Asunta Gitari, Jan van der Lee



The problem - Sub Saharan Africa

>In most sub-Saharan countries, milk marketing systems suffer from poor milk quality, unfunctional quality control systems

>Most of the marketed milk passes through an informal channel, making quality control more challenging



 \succ In most cases, milk collection is only done once daily

>Farmers limited from selling evening milk

The Ethiopian context



Milk Transportation

Smallholder farmers struggle to access inputs and services needed to improve their milk production

 Lack of functioning cold chain results in significant milk spoilage with up to 20% of milk production being lost

Designing the pilot study in Ethiopia

The IKIC Solution



Milk can with Orbs and casing

• IKIC Impact Ventures BV, Belgium, is piloting this passive cold chain solution

- It is especially effective where access to energy & transport is limited
- The solution uses thermostatic batteries with stainless steel casings containing a phase-changing material
- It allows a stable & predictable cooling



Results and discussions

Results 1: Evolution of temperature inside and outside cans





Implication of results

- Placing Orbs in the cans reduces milk temperature
- Insulating cans with Orbs increases efficiency of temperature reduction
- Using 18 Orbs effectively cools 20l of milk but 16 Orbs did not take it to a good storage temperature
- The solution cools down fresh milk below 4° C and maintains this temperature till it reaches the milk collection point
- This increases fresh milk quality and prevents bacteria growth

Results 2: Comparison of temperature in cans with 16 and 18 orbs



The impact

- Smallholders will sell evening milk leading to 50% increase in household income
- Dairy coops will source milk from further areas

& receive higher quality milk



Pouring milk into can with Orbs and casing



Wageningen University & Research P.O. Box 123, 6700 AB Wageningen Contact: asaah.ndambi@wur.nl T + 31 (0)317 12 34 56,M +31 (0) 614 614 406 www.wur.nl/

Authors: Asaah Ndambi¹, Lotte Staelens², Zelalem Yilma³, Asunta Gitari⁴, Jan van der Lee¹

¹Wageningen University and Research

²IKIC Impact Ventures BV, Belgium

³BRIDGE+ project Ethiopia

⁴University of Nairobi



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