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DAIRY PROJECT

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# SDP POLICY BRIEFS

## Improved Child Nutrition through Cattle Ownership in Kenya

### Key points

- Tackling malnutrition, especially micronutrient deficits, can have considerable long-term benefits for individual children, both physically and mentally
- Milk consumption is very effective in addressing these micronutrient deficiencies in children, especially for poor households, as well as providing an important source of protein.
- Cattle ownership offers a potential route to improved child nutrition, whether by increasing milk availability or by increasing household incomes.
- For these potential benefits to be realized, more understanding is needed of allocations of milk and control of resources within households.
- Continued efforts to educate people on the benefits of milk consumption, and to increase children's access to milk through means other than cattle ownership, would also be beneficial.
- Policy directions that encourage milk availability and consumption will bring significant long-term benefits to the health and economy of Kenya.



### Introduction: the incidence of malnutrition

Malnutrition affects large numbers of children throughout the developing world. In Kenya, nearly one-third of children showed evidence of chronic malnutrition in the mid 1990s. A major cause of malnutrition in Kenya<sup>1</sup> is inadequate dietary intake, both in terms of quantity and quality.<sup>2</sup> The effects of inadequate intake are most pronounced during periods of rapid physiological change, such as pregnancy or childhood and adolescence. The consequences of malnutrition include reduced resistance to disease, retarded physical growth, poor cognitive development, and reduced physical activity.

Such factors diminish the productivity not only of individuals, but collectively of societies and whole nations. This brief considers how positive factors, such as cattle ownership, can encourage milk intake, especially among the young.

### Combating malnutrition

Animal-source foods, including dairy products, are an excellent source of essential micronutrients and high-quality protein.<sup>3</sup> Important micronutrients present in dairy products, but poorly available from non-animal-source foods, include calcium, vitamin B12, iron, zinc, and vitamin A. Despite their importance, however, the majority of poor adults and children in developing countries eat little or none of these foods, which are often not available or affordable.

In Kenya, the situation is more favourable. Milk is widely available, even to poor households, usually in raw form through informal markets. Several studies have illustrated the value of milk consumption in combating malnutrition (box 1).

Surprisingly, it is much less clear whether actual ownership of dairy cattle brings nutritional benefits to the children within a household. A recent Kenyan study has attempted to shed light on this issue (box 2).



**Box 1.****Studies demonstrating the benefits of milk consumption**

Studies which have demonstrated the benefits of milk consumption for child development include:

- A study in five Latin American countries by M.T. Ruel,<sup>4</sup> showing that milk intake is associated with better growth<sup>5</sup> in children during the critical developmental stage from 12 to 36 months of age.<sup>6</sup>
- A review by Neumann and Harris of the role of proteins of animal origin, including milk, in improving diet quality for children.<sup>7</sup> The report concludes: ‘Investing in diet improvement for children and women of reproductive age would maximize the chances of improvement of pregnancy outcome, and growth and cognitive development and school performance of children. Such a capital investment would promote social and economic development of a community and a nation.’
- An ongoing study in Embu, Kenya, by the Global Livestock Collaborative Research Support Program has shown that supplementation with animal-source foods has positive effects on Kenyan schoolchildren’s growth and cognitive performance. The effect is highest in the case of meat supplementation, followed by milk supplementation, and lowest for energy supplementation.<sup>8</sup>

**Box 2.****Data sources and methods**

A study carried out in Coast and Central Provinces, Kenya, used household surveys of cattle-owning and non-cattle-owning households to examine the impacts of dairy cow ownership on the nutritional status of pre-school children.<sup>9</sup> The surveys included anthropometric measurements (including height and weight) of all household children under the age of five. The study developed a conceptual framework that identified key pathways through which dairy cow ownership, and associated income levels, may have both positive and negative impacts on child nutritional status. Econometric models were used to estimate the impacts on child nutritional status of the number of dairy cows owned, controlling for child characteristics, household head characteristics, and other household characteristics such as income level.

**Dairy cow ownership and child nutrition**

Many initiatives in Kenya have sought to promote dairy cow ownership as a means of improving livelihoods. However, the impacts of owning a dairy cow on child nutritional status may be mixed, depending on household choices concerning the allocation of additional income and milk from dairy cattle.

On the one hand, dairy cattle ownership can bring benefits to the household and its children:

- There is an increase in the amount of milk available for household consumption.
- The sale of milk can increase household cash income, which can then be used to purchase further nutrients.
- The use of cattle manure may increase food crop yields.

However, negative factors may offset the nutritional benefits of increased income and milk availability:

- Cattle grazing and fodder requirements may reduce the land available for food crops.
- Income from milk may not be used to augment the household’s nutrient intake.
- Cow ownership may reduce the household income controlled by women, who have a greater propensity to spend additional income on food or health.
- The child’s caregiver may allocate more time to looking after the cattle, and less to childcare and feeding.

**Study results**

The study of the impact of dairy cow ownership on the nutritional status of pre-school children carried out in Coast and Central Provinces (see box 1) produced the following findings:

- Children from cattle-owning households had a higher HAZ (see footnote 5), indicating lower levels of stunting (figure 1). This result was independent of household income levels.

- The positive impact of cattle ownership on nutrition was greater at the coast than in the highlands, perhaps because existing high levels of milk consumption in the highlands extends to non-cattle-owning as well as cattle-owning households.
- Whilst dairy cow ownership has a significant positive influence on household cash income,<sup>10</sup> no significant effect of household income on child nutritional status was found (perhaps because of some of the negative factors mentioned in the previous section).

Further research is needed to clarify the reasons for these findings and regional differences. A greater understanding of the complex relationships between child nutrition and such factors as intrahousehold control and allocation of resources, income, and

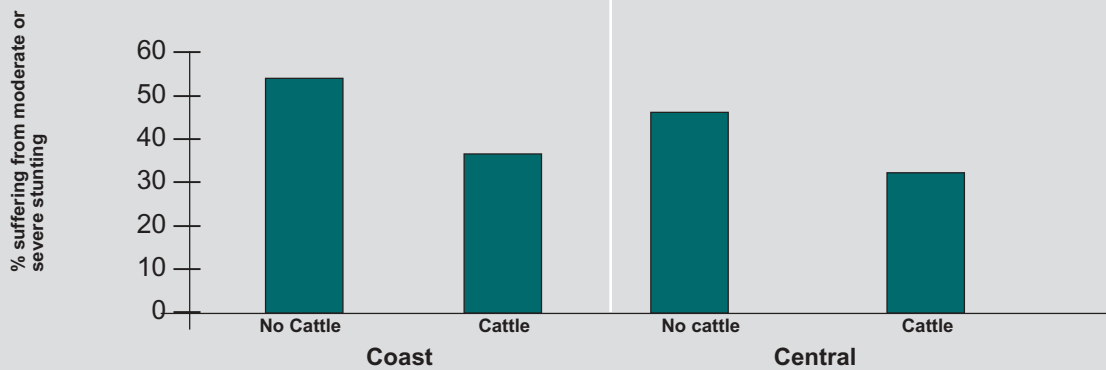
nutrients would help ensure that the benefits of dairy cow ownership are felt by the children of the household.

## Conclusions

The following conclusions can be drawn from this consideration of the effects of cattle ownership on child nutrition:

- Ownership of cattle, including local zebu cattle, is demonstrated to have a significant positive association with improved child nutritional status.
- However, the widespread incidence of dairy cattle ownership throughout Kenya is still not having as positive an effect as it might on child nutrition.

**Figure 1. Child nutritional status: effects of cattle ownership on proportion of stunted children in surveyed households**





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The Smallholder Dairy Project (SDP) carries out research and development activities to support sustainable improvements to the livelihoods of poor Kenyans through their participation in the dairy sub-sector. SDP is jointly implemented by the Ministry of Livestock and Fisheries Development, the Kenya Agricultural Research Institute, and the International Livestock Research Institute, and is funded by DFID.

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- Much more knowledge is needed of the complex pathways through which dairy cow ownership influences nutritional outcomes.
- Policy directions that encourage milk availability and consumption will bring significant long-term benefits to the health and economy of Kenya.<sup>11</sup>

## Policy implications

The following policy directions might assist realization of the benefits of milk consumption, especially to child nutrition:

**Dairy cow ownership.** Cattle ownership provides potential to improve child nutritional status, whether from direct milk consumption, or via milk sales for purchase of other quality foods. The benefits of initiatives that encourage dairy cow ownership are not being fully realized; there is therefore a need for nutritional education programmes designed to increase household awareness of the prevalence of malnutrition and household-level options to enhance the nutritional benefits of dairy cow ownership.

**Increased milk availability.** Resource-poor households not owning dairy cattle may find it difficult to access the animal-source nutrients which, as research in Embu and other locations has shown, enhance child cognitive and physical development. How to increase the availability, accessibility, and utilization of these foods in developing countries is a major challenge. Kenya is fortunate in having a widespread informal market which makes cheap raw milk widely available. The impact on nutrition should be considered for any policy change that could affect the current widespread access to affordable milk for poor households. Related research has indicated consumer preference for this milk, which is routinely boiled to eliminate bacterial contamination,<sup>12</sup> over more expensive processed milk.<sup>13</sup>

**School programmes.** Another potential approach to encourage consumption of milk by young schoolchildren is through promotion of the school feeding programmes, such as the school milk programme.

**Health dimensions.** Diet quality, including access to meat and milk, may also have a role in management and supportive care for HIV/AIDS patients.<sup>3</sup> This again is of relevance to policymakers in Kenya.

<sup>1</sup> Other factors that can influence malnutrition levels include disease prevalence, inadequate maternal and childcare practices, poor water and sanitation conditions, and inadequate health services.

<sup>2</sup> Quality in terms of micronutrient content and protein-to-energy ratio.

<sup>3</sup> High quality in that it is readily digestible and contains all the essential amino acids.

<sup>4</sup> Ruel, M.T. 2003. 'Milk Intake Is Associated with Better Growth in Latin America: Evidence from the Demographic and Health Surveys.' *FASEB J.* 17 (4), Abstract 445.10, p. A729.

<sup>5</sup> Measured as height-for-age z-scores (HAZ). Z-scores compare the individual child to a reference population of the same age and sex. HAZ is an indicator of long-term nutritional status. A low HAZ is said to indicate 'stunting'.

<sup>6</sup> After controlling for income levels, socioeconomic status, and other potentially confounding factors at the child, maternal, and household levels.

<sup>7</sup> Neumann, C. and Harris, D. 1999. 'Contribution of Animal Source Foods in Improving Diet Quality for Children in the Developing World.' The World Bank, Washington.

<sup>8</sup> Whaley, S., Sigman, M., Neumann, C., Bwibo, N., Guthrie, D., Weiss, R., Murphy, S., and Alber, S. 2002. 'The Impact of Dietary Intervention on the Cognitive Development of Kenyan Schoolchildren.' *Child Nutrition Project Brief*, Global Livestock CRSP, UCLA.

<sup>9</sup> Nicholson, C.F., Mwangi, L., Staal, S.J., and Thornton, P.K. 2002. 'Dairy Cow Ownership and Child Nutritional Status in Kenya.' Draft Report, Smallholder Dairy Project.

<sup>10</sup> See brief 3, 'Competitiveness of the Smallholder Dairy Enterprise in Kenya'.

<sup>11</sup> See brief 6, 'The Policy Environment of Kenya's Dairy Sector'.

<sup>12</sup> See brief 4, 'Public Health Issues in Kenyan Milk Markets'.

<sup>13</sup> See brief 1, 'The Demand for Dairy Products in Kenya'.

<sup>14</sup> See HIV/AIDS: A Guide For Nutrition, Care and Support. Food and Nutrition, Technical Assistance Project, Academy for Educational Development, Washington, D.C., 2001.