PART A

DAIRY SUPPLY CHAIN

STRATEGY FOR MAURITIUS

J. RAMKISSOON
(07/09/05)
LIVESTOCK DEVELOPMENT PLANNING

THE DAIRY SUPPLY CHAIN OF MAURITIUS

INTRODUCTION

A strategic planning for livestock development requires a holistic and integrated approach, that is, a complete commodity / food chain analysis that takes account of the inter connectedness and dynamic interactions among all the various players, in the ‘farm-to-fork’ chain.

Hence the consideration here of the development of a ‘Dairy Supply Chain Strategy’ (filière lait) with focus on the integration of fresh milk production, the most critical component in the chain, with the manufacturing / processing sector.

The Dairy Supply Chain may be schematised in its simplest form in Figure I which also situates the ‘Village Laitier’ project.

My submission is therefore in two parts:

PART A: Proposal of the contours of a ‘Dairy Supply Chain Strategy’, which still need to be fleshed out in more detail and supported by appropriate data / statistics. The aim is to provide a framework and starting-point for a fresh attempt at development planning of the dairy sector.

PART B: Conceptualisation of the ‘Village Laitier’ development project, highlighting the major elements for consideration in its set-up, to be followed by the drawing out of a detailed blueprint of the project.
PART A Outline of a ‘Dairy Supply Chain Strategy for Mauritius’

The ‘Dairy Supply Chain’ in Mauritius is characterised by two entities which are virtually separate, with insignificant connectedness:

1. The traditional cowkeeper sector
2. Emergence of a relatively modern manufacturing / processing sector, involved in processing of dry milk powder, all imported, to manufacture diverse products.

The traditional sector

Many studies and reports on the milk sector have been produced over the past 40 years or so, and the following is a brief overview of the sector.

Also known as the ‘small cowkeepers’, this enterprise is involved in raw milk production, family-consumed and marketed for the most peripherally, with little capture by the Milk Marketing Scheme (of the AMB) which itself is limited to primary processing (pasteurisation).

Production system / structure is family-based with part-time involvement, small and geographically dispersed, essentially a low-input / low-output system.

Although dairy products consumption has been increasing with betterment in purchasing power, the consumption of domestic fresh milk has been decreasing, both in relative and absolute terms. It covers just 2-3% of fresh-milk-equivalent consumption today.

Such trend is a consequence of a continuing regression in domestic production, itself a result of a continued proportionate decline in both cows and cow-keepers, implying no improvement in productivity, hence no increase in intensification and modernisation of the operations. And this despite the wide array of State aid for many years (stats on this).

Yet some positive cases appear to occur, although they may be exceptions. Some 4/5 breeders of Triolet (average of 10 animals / unit) and a couple of the Nouvelle Decouverte operators (medium sized) who are reported to be performing quite efficiently.

Table I provides a situational analysis of the dairy food chain, with most points referring to the traditional sector and being objective, while some may reflect only perceptions.
### STRENGTHS

- Historical, Socio-cultural attachment to the cow-keeping activity (resilience of the traditional production system)
- Emergence of some medium-sized and professionally-oriented enterprises
- Easy trainability of some of the existing and most of the potential operators/partners.

### WEAKNESSES

- Lack of a **policy and strategic framework**, of a holistic approach to the ‘filière’
- Focus so far limited to development possibilities by productive system (i.e. within the traditional sector)
- Limited land resource base
- Poor animal resource base – quantity and quality (genetic potential)
- Inadequate feed resource base (quality and quantity) seasonality of fodder availability (scarcity in drought and winter season)
- High cost of feed production, increasing milk production cost
- Management deficiencies / lack of professionalism
- Limited absorptive capacity of traditional system for technological inputs
- Part-time nature of most production units
- Smallness and geographical dispersion of production units
- Aging of producer population in traditional systems
- Declining availability of family labour owing to alternative employment opportunities & perceived drudgery of the activity
### WEAKNESSES (cont.)

- Insecurity of the market and prices
- Environmental pressures (siting in residential areas; waste disposal;
- Deficiencies in quality and presentation, tending to suppress demand for local fresh milk
- Individualistic nature of operators, suppressing collective / joined-up initiatives
- Extremely limited connection between primary production and the manufacturing / processing sector
- Institutional framework / support

### OPPORTUNITIES

- Existence of high market demand for most milk-based products
- Availability of by-products and residues for potential use as feeds
- Positive health status of island: freedom from most diseases and pests (except for the *Stomoxys Fly*)
- Relatively good infrastructure
- Institutional system and its potential support
- Health consciousness: nutritive value of milk and dairy products / consumer preferences
- Comparative advantage of fresh milk for processing of some dairy products: yoghurt; fermented milk; fresh cream; processed liquid milk
- Easy trainability of potential operators in the sector
- Depreciation of the rupee tending to make domestic production more competitive
- Possible reverse movement of labour towards agro-industrial / dairy sector, as a result of looming risks to the sugar and manufacturing sectors.
- Decreasing competitiveness of the sugar sector
- EU Sugar Regime Reform: Aid package within accompanying measures and possibility of partial channelling towards agro-industrial diversification.
### Opportunities (cont.)

- World trend (at international trade level), requiring a revisit and readjustment of economic activities
- Diminishing domestic support and export subsidies in the developed world: tendency to increase prices on the world market
- Socio-economic pressures for employment creation and balance of payments improvement
- New government drive to boost the small agriculture / enterprise sector, and agro-industry in general

### THREATS

- Dumping from world market
- Socio-economic and environmental consequences of development in the non-agricultural sector
- Environmental pressures/ norms: siting in residential areas; waste / pollution and disposal / abatement; land degradation
- Near-extinction of the small dairy sector including genetic resources (the Creole cow)

It is clear that the lingering production system and structure *(Table I)* does not respond to the modern market demand characteristics *(Figure I)*, hence the difficulty of its effective integration in the supply chain.

Survival of the sector therefore requires adaptation to a new environment, implying an increased degree of integration in the food chain where processing and distribution are the prominent drivers.

The **VISION AND CHALLENGE** for the Dairy Supply Chain may be summarised as follows:

*How to re-structure the dairy supply chain into a modernised, professional and market-oriented system, wherein the share of primary domestic production (fresh milk) is greatly enhanced and increasingly integrated; while ensuring its social, economic and environmental sustainability.*
Notes:
(a) This is only my view ~ still has to be confirmed and a consensus obtained on it, because it has to be a shared vision for the supply chain requiring commitment of one and all towards attaining it.

(b) Planning for livestock development remains a complex task compounded by the generalised lack of data: Economical / Statistical picture ~ inputs from Veterinary Services; AREU; AMB; APD; Customs/Trade Stats and data need to be made available and consistent.

The achievement of this strategic vision, and especially considering outcome of past initiatives, calls for huge organised efforts at all levels to act on the supply chain, and particularly at the level of primary production.

PRIMARY PRODUCTION

Strategic Goal I: Restructuring the primary production base

The baseline situation remains a prominently traditional productive sector, alongside which are only recent introductions of just a few ‘professional’ medium-scale units. The strategy choice then is among the alternatives of:

(a) Improving traditional production and expanding these systems;
(b) Improving and expanding existing (emerging) modern forms of production
(c) Introducing new and modern systems to cohabit with traditional ones;
(d) Introducing capital and technology into traditional systems at such a rate that complete transformation into modern production systems is achieved.

In Mauritius, the emphasis over the past 4 decades or so has been on (a) and (d), with no success.

A paradigm shift is thus called for, with a more focussed look at the relative place of different production systems in the process of development (a combination of approaches, particularly (b) and (c), eg. Village laitier project rather than over-concentration of efforts on development possibilities within production systems (i.e. the traditional sector), although the strategic choice will still hardly be able to completely ignore improvement of latter because of economic and socio-political necessity.

Another strategy choice is between selective and comprehensive approaches to livestock development.

This is another illustration of erroneous strategic choice for the development of the traditional milk sector, where again emphasis over the past 4 decades or so has been on comprehensive production-oriented approaches when the absorptive capacity of the sector for technological inputs was limiting for many reasons.
The selective approach of a focus on general education / training, and infrastructure / investment, essential prerequisites ‘to prepare the way’, would have been more appropriate for a long time (and still is).

The setting up of training programmes and infrastructure is a priority - In the context of encouraging restructuring the introduction through State aid of novel models of production, e.g. ‘Village Laitier’, and others (see Part B).

**Strategic Goal 2: A reform of State intervention / support measures** ~ re-orientation towards support to new strategy (under Strategic Goal I) ~ Committee at Ministry level reviewing incentives & other support measures.

**Strategic Goal 3: Appropriate Animal Health & Reproduction / Breeding (AI) strategy** ~ Vet. Services input and support ~ Review of Animal Health Bill ~ Mn Committee working on latter.

**Strategic Goal 4: Land availability and allocation to fodder production.** Identification of appropriate State lands, even incentives for private sector lands (small and large planters) for conversion to fodder cultivation in appropriate sites (land availability ~ input from Land Use Division / Forestry Services; cow-keeper dispersion and numbers / fodder requirements ~ input from APD, Vet Services, AREU).

**Strategic Goal 5: Optimising input of State support Agencies** ~ AREU (R & D); FARC (Planning); quality norms (Agric. Services; Dairy Chemistry / Food lab); physical inputs (APD).

**Strategic Goal 6: Review of the role of the State** (in the context of the current declared policy of economic democratisation by the State and that of other economic agents.)

**Strategic Goal 7: Achieve better stakeholders representation and involvement (participatory approach)**. Set up a high level ‘Dairy Supply Chain Forum’ (Interprofession) chaired by Minister himself, to steer the way forward towards achieving the shared vision agreed upon.

**PROCESSING AND DISTRIBUTION**

The strategic measures at level of processing and distribution / consumption are only a few, related to fiscal incentives at processing and distributional levels (equipment / packaging, etc.); consumer education / sensitisation on nutritive value of dairy products; product diversification (nature, presentation, conditioning etc.); and monitoring of retail outlets and storage-facilities to ensure conservation / quality norms and standards.

J. RAMKISSOON
07 September 2005
### (A) PRODUCTION SYSTEMS AND STRUCTURES

<table>
<thead>
<tr>
<th>PRIMARY PRODUCTION (FRESH MILK PRODUCERS)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Existing</strong></td>
</tr>
<tr>
<td>Traditional, small cow keepers</td>
</tr>
<tr>
<td>Medium-sized enterprises</td>
</tr>
<tr>
<td>State owned stations (Ministry, AREU, Richelieu Prison)</td>
</tr>
</tbody>
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### IMPORTS

- **Milk Powder**

### IMPORTS

- Powdered Milk + range of dairy products

### DISTRIBUTION/RETAIL INDUSTRY

- Private Enterprises & AMB

### MANUFACTURING / PROCESSING INDUSTRY

- 3-4 Private Enterprises: Small to Large Scale

### AMB

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### (B) MARKET SIGNALS

1. **Manufacturing needs**
   - Critical mass/volume per production unit
   - Organoleptic and hygienic quality
   - Continuity/Regularity of supply
   - “Reasonable” Farm gate prices

2. **Consumer needs**
   - Increasing sophistication
   - Wide choice
   - High quality/hygienic products
   - Reasonable Retail Prices

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*Dairy Supply Chain*
PART B

THE VILLAGE LAITIER PROJECT

SOME CONCEPTUAL CONSIDERATIONS AND RECOMMENDATIONS

J. RAMKISSOON
(07/09/05)
PART B: The “VILLAGE LAITIER” and Other Production Systems/Models

The case for a restructuration of the dairy supply chain, particularly at primary production level (fresh milk production), has been made in Part A.

One specific project idea proposed by Government for the agro-industrial livestock sector is that of a “Village Laitier”. This second part will attempt at conceptualising this project, covering some of the strategic and tactical issues at project design level.

**Presumed Objectives of the Project:**

These may be summarized as follows:

(i) To increase fresh milk production and ensure its effective integration with the manufacturing / processing sector
(ii) To enhance employment opportunities through an increasingly diversified agro-industrial sector
(iii) To serve as a pilot project demonstrative of production facilities transitioning towards more sustainable (profitable and environmentally-friendly) systems that may be replicated depending on its outcome

**CHOICE OF MODEL/SCALE OF OPERATIONS**

The “Village Laitier” as a pilot-investigational dairy farm must be a showcase of planned milk production that should incorporate organized marketing facilities as well.

The transitioning towards more sustainable systems connotes a change to the modern system, by the concurrent acceptance, adoption and adaptation of new technologies and good management/agri-business practices.

The challenge of the management plan for the project would be how to balance the resources of land, labour and capital over the key functional areas of the dairy farm: milking; housing; feeds and manure storage.

Land constraint would dictate choice of intensive zero-grazing, confinement systems as opposed to extensive grazing system, but some combination of these may be envisaged depending on the land extent available, the site and its suitability assessment.

Increase in size generally results in increased feed and labour efficiencies because of herd composition; better genetics; more intensive feed management; and more modern facilities.
However, size and scale of operations will again depend on land availability which will also impact on input/feed procurement strategies: in-situ production or purchases or combination of both.

**SITING**

The following siting possibilities exist:

(i) **Palmar Livestock Breeding Station (approximately 310 arpents)**

We made a site visit there, and it appears that some 225 arpents of reserve lands are available. However, its suitability needs to be better defined, because of its apparent rockiness, and vicinity to tourism zone, although the positive point could be a design that may offer agri-tourism opportunities.

(ii) **Others**
- 30 Arpents at Nouvelle Decouverte
- Salazie (acreage?)
- La Flora (SIT Lands) – part of 100 Arpents earmarked for agro-industry projects.
- Rose Belle Sugar Estate (Part of the 300 Arpents earmarked for agro-industry projects, as announced by DPM and Ministry of Finance)

**CHOICE OF DAIRY BREED (RACE LAITIERE)**

The most appropriate breed appears to be the Friesian or an appropriate Friesian-cross. The local ‘breed’ of Creole cows is almost non-existent and therefore reliance would be on the Friesian and its importation.

The potential sources of supply are South Africa and Australia. The South African source may be cheaper.

An appropriate strategy of stock procurement through importation should be worked out, e.g. import could be effected in a strategic alliance with slaughter cattle importers, and taking account of the past attempts and experiences of heifer importations.

**NUTRIENT MANAGEMENT PLAN**

This is the most critical component of the overall management plan, having the most significant impact on production cost and profitability. Findings of nutrition research (AREU), should be applied to determine the appropriate fodder species; the appropriate concentrate/compounded feeds and ration formulation and feed technologies to match the
nutritional needs of the various categories of livestock: milking and dry cows; heifers; calves; and possibly some male (breeding) bulls that may be around.

**HOUSING AND DAIRY FACILITIES**

The best options should be considered, with the objective of planning to build the basic structure; additional facilities may be added later when the finance is available.

Appropriate designs for the various housing requirements (milking parlour; calf pens; storage, etc) exist; and should be adapted to the requirements of the chosen site and use of locally available materials and resources.

**SERVICES INPUT**

Institutional support of the Veterinary Services and APD (Agricultural Services) and Research and Extension (AREU) should be coordinated and organized, sustainable and effective, pertaining to the area of animal health and reproduction (provision of AI services); and technical and management advice.

**MARKETING/PROCESSING**

The starting option could be integration with existing outlet facilities (AMB or private sector), which would be much easier to organize given the size and volume of product involved.

The setting up of a processing unit may be envisaged in a second phase of the development plan.

**MANURE/LIVESTOCK WASTE MANAGEMENT**

Again this is a sensitive area, and existing techniques and technologies of handling and storage, composting, disposal, etc, could be tapped. It can even become a useful source of additional income because of the high demand of manure by the agricultural/horticultural sector. Production of biogas could also be appraised.

**INVESTMENT/ORGANISATION AND OWNERSHIP ISSUES**

Various models of organization/ownership and participation may be considered. One proposal is the BOT system, and expression of interest for such option maybe sought. Submissions already made from the private sector may also be considered, while taking account of the declared policy of the Government on economic democratization.
The concept of “Village Laitier” may also connote a self-contained and comprehensive entity that, at the every extreme, also includes an in-situ residential community of breeders, each managing a holding of critical size to sustain the family unit.

The experiences of the Maison des Eleveurs at Henrietta, and the Cow Breeders Cooperative Society Limited at Nouvelle Decouverte, should be probed and analysed when options of a collective organization are considered.

**POLICY ENVIRONMENT**

The role of the State in the launching of such projects should be well defined and understood from the very start.

The project should benefit from the incentives package already tailored to encourage the transitioning of the traditional sector towards more ‘modern’ systems.

Project-specific support schemes could be envisaged on a case-to-case basis, based on the feasibility studies/business plans of projects that come from the private sector.

**RECOMMENDATION**

*The charting out of a detailed blueprint for the “Village Laitier” project to be commissioned by the Ministry.*

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*Director General*