

Study on the Kenyan Animal Feed and Fodder Sub-sectors

Dairy Sector Structure

(Sub-report II)

BLGG Research by

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SUMMARY

The growth and competitiveness of the feed and fodder sub-sectors largely depend on the structure and functioning of the wider dairy (or livestock) sector in terms of the latter's competitiveness, regulatory environment, policies, consumer demands and growth path.

Although portraying a simplified structure of the Kenyan dairy industry, Chapter 2 of this report shows that the sector's structure is complex and consists of many entities with different production systems, levels of organisation, marketing channels, products of varying quality and levels of value addition and differentiated end-markets and accompanying consumer demands. The structure is characterized by fragmentation and segmentation, and stakeholders that operate at different levels of development and maturity.

Chapter 3 introduces a conceptual tool to analyse and better understand the structure and development phases of a dairy industry, and the interaction between private and public initiatives and demands for policies and regulation. Chapter 3 introduces the Dairy Sector Life Cycle concept and describes the dairy sector development phases in NW Europe/the Netherlands. It shows amongst others the important roles of the public and the private sector, and how these roles shifted over time in line with increased maturity level of the sector. It also highlights how this impacted on the feed sector and how this sector developed and matured hand-in-hand with systemic changes in the dairy industry, consumer awareness and demands, and in turn also spurred growth of the dairy industry through technology breakthroughs.

Chapter 4 contains a system analysis to describe and better understand the behaviour of entities and stakeholders in the dairy sector. The concept of the Maturity Index (MI) is used to explain the "inability" of entities to effectively align and interact in one and the same system, if they are operating at different stages of development and have diverging Maturity Indices. It is shown that cooperation between companies sub systems is more successful when MIs are more uniform and equal (the closer the MI of the companies/sectors, the more successful their cooperation will be).

Chapter 5 revisits the former sections and tries to benchmark the present day Kenya dairy sector against the Dairy Sector Life Cycle, in order to see what lessons could be learned.

Compared to the situation in the Netherlands in the mid-20th century, the Kenyan dairy sector is much more heterogeneous. A key factor for integration and harmonization of the dairy sector in the Netherlands in the 1950-ies was the role of Government. Despite the more complex present day situation of the dairy sector in Kenya as compared to the Netherlands 60 years ago, it is argued that in the current dispensation of the dairy and the feed sector, the Kenyan government should play a much more pro-active role in sector governance. This involves policy making, regulation and sector development. As for the latter, notably the important role of government in dairy education, training and knowledge transfer, was key in the Netherlands for driving development in the sector.

It is further concluded that a second pillar for sector integration and bringing sanity and order into the dairy and feed industry, concerns the need for value actors to organise themselves in effective cooperatives, industry associations and sector platforms.

The private sector can take more initiative to tackle systemic issues that affect the sector as a whole, be it productivity at farm level, breeding, feed and fodder, milk quality and costs and quality of feeds and fodder. Even in the absence of effective government regulation and enforcement (and thus level playing field), there is scope for self-regulation and investing in stronger more quality-driven and integrated milk and feed/fodder supply chains. The same applies for AI services, for example if importers and distributors of semen would employ, train, certify and supervise “own” inseminators. Rather than to depend on private technicians - of dubious skills and business ethics - over which they have no control.

In chapter 5 the model of the Dutch Product or Commodity Boards is introduced, as an example for creating strong and effective public-private institutions, to spearhead the dairy and the feed industry. These Boards have a wide mandate for policy making, sector regulation, enforcement and sector development. They are managed by the private sector but supervised by government. The Boards have a mandate to levy contributions from the industry and – during the first decades of their existence - received robust additional government funding. The Boards have representation from stakeholders across the sector or production column.

Chapter 6 gives conclusions and recommendations for the dairy sector and the animal feed sector. Not surprisingly considering the previous chapters, these centre on:

- a) The need for a more prominent role for government in sector governance.
- b) Private sector organisation and self- regulation, and
- c) Establishing strong sector institutions with shared public-private representation.

As for the feed sector the following recommendations are made:

- a) Government should be more pro-active in creating the necessary structure and legislation for example regarding raw material imports and quality standards, chain management and licensing of feed manufacturers (crowding out the informal sector).
- b) Access of feed manufacturers to year round quality raw materials can be improved by reforms in import regulations and duties and stimulating local production and processing of raw materials.
- c) Independent, credible, laboratories should be created to ensure the quality of animal feed via regular testing and analysis.
- d) Leading animal feed manufacturers – within and outside AKEFEMA - should cooperate to create and lobby for the necessary structure and legislation for further development of the Kenyan feed sector. They could also work together on putting internationally accredited animal feed and fodder testing facilities in place. Possibly in partnership with international laboratories and donor agencies.
- e) The concept of an Animal Feed Board that brings together all policy, regulatory and sector development issues in one institution could be a way out for the systemic bottlenecks that are plaguing the feed industry. Such an institution should be governed by all major stakeholders in the sector like Government, AKEFEMA, farmers’ associations (dairy, meat, poultry), animal products processing industry (e.g. KDPA), consumer platforms. The Dutch Animal Feed Board could serve as an example of such an institution.

Lessons learned from other - more mature - dairy economies show that fodder or forage - and proper preservation of it – forms the backbone of sector competitiveness and growth:

- a) In Kenya there is a pressing need and high potential for expansion and optimization of commercial fodder supply chains across the chain from use of high yielding variety seeds, increased production per hectare, improved mechanisation and preservation, enhanced nutritive value and logistics for transport.
- b) Benchmarking with fodder crop production in the Netherlands and other countries with a developed dairy and fodder sector (e.g. South Africa) is recommended.
- c) Investment in innovation, knowledge and skills for commercial mechanised fodder production, is recommended as one of the most strategic and important intervention choices for the Kenyan dairy sector.

1. INTRODUCTION

The BLGG consortium was contracted by SNV Kenya to carry out an Animal Feed and Fodder Study in the context of the Kenya Market-led Dairy Program (KMDP). The goal of this study was to identify the gaps/bottlenecks that hamper the development and growth of the Kenyan feed and fodder sub-sectors, and as a result the Kenyan dairy industry (for further details on the consortium and objectives of this study see sub-report I: “Summary Report”).

This comprehensive assignment was divided in a number of sub-studies which resulted in the sub-reports as listed in Table 1. The current document is sub-report II: Dairy sector structure.

Table 1. Study on the Kenyan animal feed and fodder sub-sectors: Overview of the sub-reports

No	Title	Author
I	Summary report	BLGG Consortium
II	Dairy sector structure	BLGG Research bv
III	Kenya feed industry policy and regulatory issues	ABS TCM Ltd
IV	Interviews and HACCP audits of Kenyan feed manufacturers	BLGG Kenya Ltd/ AgriQ Quest Ltd
V	Quality analysis of animal feedstuffs and fodders in Kenya	BLGG Research bv
VI	Trends in the Kenyan fodder sub-sector	Perfometer Solutions
VII	Trends in the Dutch fodder sub-sector	BLGG Research bv

In sub-reports III – VII of the comprehensive study numerous factors are identified that hinder the development of the animal feed and fodder sub-sectors in Kenya, as are opportunities or suggestions for solutions. These are dealt with in each sub-report separately from different perspectives (policy, feed quality and consistency, cost of production, knowledge, technology level and so on).

However, the feed sector should not be looked at in isolation. The systemic issues that hamper the feed and fodder sub-sector, are exemplary for - and intertwined with - the state of affairs and growth path of the entire dairy sector. As much as the feed sector impacts upon the dairy (or livestock) sector’s competitiveness and growth, the feed sector – for its own growth path - equally depends on the strength and growth rate of the dairy sector as the buyer of dairy meals, concentrates and forages.

Goal of this sub-report is therefore to look at the feed/fodder sector from a different perspective, not in isolation but as part of a bigger system and – therefore – at a higher level of analysis. It takes the dairy sector as the system that drives the “industry” of input, suppliers and service providers, including the feed/fodder sub-sectors. In doing so, this sub-report tries to describe, analyse and better understand the deeper underlying causes and forces at work in the system, and how the structure of the dairy and feed industry impacts upon its ability to grow and enhance competitiveness.

Chapter 2 of this report shortly describes the structure, trends and emerging issues of the wider Kenyan dairy sector, of which the feed industry is part.

Chapter 3 introduces a conceptual tool – the Dairy Sector Life Cycle - to analyse and better understand the development phases of a dairy industry and the transition from start-up phase to maturity. The example of the Dairy Sector Life Cycle for NW Europe or the Netherlands is used to illustrate this process, and the role of the private and the public sector in transitioning the structure from fragmentation to integration.

Chapter 4 contains a system analysis to describe and better understand the behaviour of (interacting) entities and stakeholders in the dairy sector. The concept of the Maturity Index (MI) is used to explain the “inability” of entities to effectively align and interact in one and the same system, if they are operating in different development phases and have diverging Maturity Indices. This chapter also gives recommendations and suggestions on how this non-alignment could be addressed and overcome.

Chapter 5 evaluates the foregoing chapters and isolates crucial factors and strategies that were the drivers of integration and sector transition in the NW European dairy sector. It looks at the role of government and the private sector, and it attempts to benchmark the Kenya dairy sector structure against these roles draws lessons from this for Kenya.

Chapter 6, finally, draws conclusions from the previous chapters and gives recommendations for enhanced governance and structural changes or transition of the Kenya dairy and feed sectors.

2. STRUCTURE OF THE KENYAN DAIRY INDUSTRY

The Kenyan dairy sector is one of the most developed dairy industries in Sub Sahara Africa. Due to a growing population and middle class, both domestically and in the East African region, the perspectives for further growth are promising. However, there are many issues or bottlenecks that need to be addressed to capitalize on this expanding market and realize higher productivity, quality, efficiency and competitiveness across the value chain.

The Kenya dairy and feed sectors are transitioning on a growth path from fragmentation to consolidation and enhanced regulation and standards. Modern high-tech production, processing, marketing systems and consumer demands, co-exist next to traditional, low input and low quality/efficiency production systems, whilst most consumers still prefer raw milk and have low awareness of food and feed composition and safety. A fast growing urban middle class, compounded by a large expat community, a robust tourist industry and desire to export dairy products, however demand for added value processed dairy products, that are safe and of high quality and comply with international standards.

Knowledge and skills levels of many actors in the dairy and feed value chains are low, yet in principle access to modern technology and knowledge has tremendously increased over the last decade through internet and other media. It is assumed that, at least the commercial players in the Kenya dairy and animal feed sector, will adopt new concepts, business models and technologies much faster, if compared to the long road that was taken by the Dutch Dairy Sector Life Cycle.

Yet a recent Dairy Sector Policy study (PPD Consults, July 2013) concluded that “the Kenyan dairy industry is currently in a position where processors have low capacity utilization, and a production segment (farmers) that cannot meet the demand due to systemic barriers to productivity”. The study remarks that: “We now have a situation where the farmer and final consumer are dissatisfied with the pricing system, which points at a dysfunctional sector industry. This structure is a barrier to sector productivity and competitiveness and calls for a shared vision to address it and take the industry to the next level. The need to rally the stakeholders around an inspirational and shared vision is clear”.

The picture of the current state of affairs in the Kenyan dairy sector is complex and hybrid. It clearly will not follow a linear-like transition path as witnessed in NW Europe over the last - say – 50 or 100 years. The context is much different, also from the perspective of a globalized industry with appetite from foreign investors to put up base in East Africa. Below is a summary of the structure and the trends of the Kenyan dairy industry, albeit simplified and concise.

Production

Dominated by smallholder farmers with on average 3-5 cows (crossbreeds) in mixed farming system, partly zero-grazing and partly free-grazing, which produce an estimated 80% of total milk production

- Low productivity per animal (average 8 litres), high seasonality and cost price/litre.
- Low milk quality.
- Low level of specialization in dairy as a business (incl. breeding and feeding).
- Low knowledge and skills level.

- Low ability to invest and to innovate.
- Small land units and ability to scale up and mechanize fodder production/preservation, especially in Central Kenya and some parts of Eastern Province.

With a growing group of dairy entrepreneurs with medium- and large scale modern dairy farms, estimated at > 2,000 farms with 20% of total milk production, characterized by:

- Specialisation in dairy farming for milk and heifers on large(r) land units.
- Medium/high level of mechanisation, incl. fodder establishment and preservation, with as a result less seasonality.
- Higher genetic stock (breeds) and productivity, economies of scale.
- Ability and willingness to invest.
- Still high milk production costs, for a large part due to high costs of feeding.
- Need/potential for (further) skill development and exposure to international best practice dairy farming, for innovation (feed/fodder), credit and farmers' organisation.

Farmers' organisations

Low level of farmer' organisation characterized by:

- Limitation to milk collection and bulking in fragmented localized settings; no or little clustering for economies of scale.
- No major farmers' owned processors with the exception of Githunguri.
- No major national level farmers owned businesses/cooperatives in input supply or insurance, with the exception perhaps of the SACCO system.
- Weak governance and business acumen in most cooperatives and farmers owned businesses.
- Competition from relatively strong and efficient private sector owned enterprises in processing, input supply (feed, AI, veterinary supplies etc.).
- Low level of farmers association for both large scale farmers and smallholders. Some emerging (largely donor driven) initiatives like KDFF – the Kenya Dairy Farmers Association (supported by EADD), KENDAPO- the Kenya Dairy Producers Organisation (Land O'Lakes) and EDFA – the Eldoret Dairy Farmers Association (supported by SNV).

Marketing of milk

Dominated by fragmentation and a large raw milk market characterized by:

- High fragmentation with *farmers* selling raw milk directly to consumers, hawkers or traders, CBEs (farmers owned milk Collection and Bulking Enterprises) and processors. CBEs selling raw milk to institutions, hawkers/traders, consumers (milk bars) and processors. Processors buying milk from farmers, hawkers/traders, CBEs and from other processors who have excess, and some processors also selling excess milk to the raw milk market. *Consumers* buying from farmers, traders and processors/retailers.
- A large uncontrolled raw milk market both in the rural and also the major urban centres (an estimated 80% of total milk produced is consumed in raw form).

Processing of milk

The large raw milk market is paralleled by a modern fast growing processing industry that is characterized by:

- A few larger processors that dominate the national and sub-national market for processed milk and milk products (the largest 3 processors have a market share of now almost 90%).
- Access to modern equipment, finance (private equity) and skilled human resource.
- Oligopolistic behaviour of the largest processor which is not farmer-owned.
- Capitalizing on a fast growing urban (lower) middle class and an emerging export market.
- With currently a relatively low concern for supply chain development, i.e. not productivity and milk quality oriented but rather volume based (absence of QBMP-systems).
- Some smaller processors with high concern for milk quality, targeting niche markets in and outside Kenya for high-end value added products like quality yoghurts, cheeses and milk-based beverages.
- Many CBEs have gone into small scale yoghurt production (a few 1,000 litres per day), others have tried to set up Alliances or Unions for large scale milk processing which failed with the exception of Githunguri and the much smaller Meru Central Farmers Union.

Processors' organisation

The processors are yet to be united in a strong industry association that addresses sector and portrays a common vision on sector development and e.g. self-regulation.

- Only representing the larger processors.
- The Secretariat is hosted by Kenya Dairy Board.
- Mainly concerned with processor issues on an ad-hoc basis rather than with sector issues.

Growing market for processed milk: middle class and export market

Processors are capitalizing on a fast growing domestic urban (lower) middle class, and an emerging export market (EA, Gulf States), for pasteurized and long life liquid milk and other dairy products. Within these markets there is a (growing) concern for:

- Quality products with long shelf life.
- Food safety.
- Variety.
- Convenience.

Animal feed sector

A generally high-cost low-quality and largely unregulated sector, that is however crucial for a growth-oriented and competitive livestock sector. It is characterized by:

- High dependency on imported by-products with high fluctuations in availability and consistency.
- High % of dairy meals that do not comply with KEBS or international standards especially in protein content, crude ash and high risk of contamination with aflatoxins.
- Lack of raw material standards, quality control mechanisms, licensing procedures and enforcement of existing standards.

- Low in-country capacity for feed/fodder analysis.
- High crowding-in of sub-standard unqualified feed manufacturing enterprises.
- High share of farmers who have low buying power and are not prepared to pay for quality products, or have no ability to differentiate between high and low quality products.
- Underdeveloped fodder/forage supply chains.
- Weak and divided industry association (AKEFEMA) and inadequate institutional structures in government for governance of the feed industry.

Breeding services

An equally fragmented sub-sector, with lack of coordination between organisations that regulate and promote the sub-sector:

- Lack of a national registration system.
- Delivery channels of suppliers of semen to the farmers are disrupted and fragmented, with the suppliers having no price and quality control over AI inseminators.
- Herds prone to inbreeding both through the current uncontrolled and non-certified AI delivery system and the continued use of bull services.
- High demand for high breed heifers from a growing dairy industry, which cannot be met by the market resulting in prices for pregnant heifers of KES 240,000 and above.

Training and extension, veterinary services, research

The withdrawal of government training & extension services, AI and veterinary services from the mid-nineties onwards had a severe impact on the sector:

- Government retreated from these services during the mid-nineties amongst others due to structural adjustment programmes of the WB and the IMF.
- Government (and private sector) investments in practical training for the dairy sector (e.g. DTI) have been entirely insufficient.
- Research is concentrated in parastatals like KARI which have however weak linkages with the private sector and largely rely on donor funding.
- The national Dairy Training Institute in Naivasha (DTI) has remained an institution under the parent Ministry and is run down and incapacitated in terms of funding and staffing. Therefore – in the current dispensation – it has no significant impact on skill development for the sector.
- The private sector has so far been unable to fill this vacuum in service provision, training and extension. Credible service and input suppliers lack “protection” from a regulatory framework and enforcement from crowding-in of unscrupulous “counter-parts”.
- As for the dairy labour market, there is a large mismatch between the demand and supply of skilled labour.

Dairy sector institutions and governance

The policy and regulatory framework for the dairy sector are outdated and inadequate. The dairy and the feed industry lack strong sector Institutions for governance and transformation (from: Policy Study PPD Consult, 2013):

- There are no reliable statistics on total livestock size and breeds; neither are there reliable statistics on total milk production and marketing of milk (the raw milk marketing versus processed milk).
- The current policy and regulatory framework and weak implementation of existing laws and regulations hinder the growth of an otherwise dynamic dairy and feed sector;
- The liberalization of the dairy sector in the 1990s disrupted the previous role of government particularly that of Kenya Dairy Board and government extension and AI-services, but also feed supply;
- The private sector was expected to take on more responsibility for the industry, but this transition was not effectively managed and supported by Government. Industry associations are weak, poorly organized and mandated, single-issue based, and lack any sense of a shared vision for the sector;
- Public sector institutions are underfunded and fail to provide the private sector (including the feed sub-sector) with co-funding, proper mandate, a well-coordinated and effective policy framework, strict enforcement of standards and a level playing field;
- These poorly planned and governed institutional changes resulted in a vacuum and absence of strong private-public sector institutions.

Conclusion

The above mentioned summary of the structure and trends in the Kenyan dairy sector shows that the sector is highly fragmented, with numerous stakeholders operating at different stages of development and with different agendas and priorities, within the framework of weak governance structures and regulations. This may be considered as a key reason for the lack of a common vision on sector development as stated in the dairy policy report of PPD Consultants (2013).

The sector is semi-commercialized with a large raw milk market that operates de-facto under a different regulatory and fiscal regime, denying other stakeholders in the sector (notably the milk processing industry) a level playing field.

This picture equally applies to the feed sector where regulation and enforcement of standards is lacking and is largely left to the private sector that is unable – or unwilling - to set up systems for self-regulation. In the absence of effective government regulation and enforcement and an organized well-educated customer and consumer market, the system has insufficient drivers for fats tracking quality and transparency of supply chains.

3. DAIRY SECTOR DEVELOPMENT PHASES – THE LIFE CYCLE CONCEPT

Global trends show that sustained economic growth rates and the emergence of a robust middle class, is accompanied by an increased demand for and use of (processed) dairy and other animal products. This trend is clearly visible in Kenya and other East African countries, and notably in Kenya the dairy industry is in a vibrant and dynamic growth path.

Perspectives are good for further growth of the Kenyan dairy industry. However, there is need for policies and interventions that lead to a more sustainable scenario for enhanced production and productivity, skilled employment and safe, nutritious and added-value products for both the domestic and export markets.

There are many others issues that affect the operations and the competitiveness of the dairy industry apart from feed and fodder, such as knowledge and skills of farmers, organisation of the supply chain (cooperatives, processors, hawkers), cold chain and logistics, milk quality and QA systems, consumer preferences and satisfaction (the market), policies at national level and vision and capacity of institutions to govern the sector. Numerous bottlenecks have been identified in sector analyses that hinder industry development and just as many (part-) solutions have been proposed, described and prioritized. Stakeholders have been distinguished who could initiate or accelerate interventions and development.

Looking at the numerous bottlenecks and possible solutions, the major question is which factor(s) will have the highest leverage on the development and modernization of the Kenyan dairy sector. In the next chapters the authors will try to answer this question from a managerial or business point of view. The Life Cycle Concept of the development of the dairy sector in North-Western Europe, and in particular in the Netherlands, is used to underpin and analyse the actual and future challenges and threats.

Every company, business group or sector passes through several clearly distinguished phases of development. Figure 1 gives a schematic presentation of these phases, which is often referred to as the business life cycle.

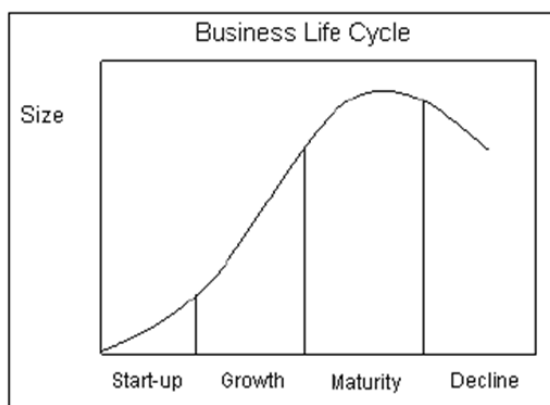


Figure 1. Schematic presentation of the business life cycle.

In the pages below, the business life cycle concept is used to describe and classify the developmental phases of a dairy sector. With this tool insights and recommendations for sector governance and priority interventions can be arrived at, which also have a bearing on the feed and forage sub-sectors.

3.1 Dairy sector development in North-Western Europe

The following chapter gives a short history of the characteristics and trends of the structure of the dairy sector structure in the Netherlands and North-Western Europe.

3.1.1 1850-1950: Start-up phase

“Farmer and processor driven”

Smallholder farming systems

During this period the population in North-Western Europe (Great Britain, France, Germany, Belgium and the Netherlands) doubled or even tripled in some regions. As a result the demand for food and employment increased. In 1850, the Netherlands had predominantly a smallholder mixed farming system where food and milk produced was mainly for own use. Excess milk was processed at the farm into butter and cheese and sold in cities or exported to England and Germany. Educational level of the farmers was low and land ownership was characterized by family smallholding. The supply chain was highly fragmented and product standardization was absent.

Producer organisations

Around 1880, the Netherlands was hit by an “agricultural crisis”, largely as a side effect of increased production in - and imports of - grain from America and Russia. In addition farmers were exposed to fierce competition, due to increased milk production and high quality cheese and butter production in neighbouring European countries like Denmark.

The increased competition necessitated the dairy sector in the Netherlands to invest in higher productivity optimize and to re-organize butter and cheese production in centralised factories, using standardized production methods and benefiting from economies of scale. This was initially organised by private milk processing companies, which were however over time replaced by farmer cooperatives. These early farmer cooperatives operated in relatively small milk sheds comparable to District level in Kenya and successfully organised members’ own-milk processing and marketing of end-products for regional and (inter-)national markets.

Because of the success of milk and butter cooperatives, and to further strengthen their position, farmers established other cooperatives for input and services provision such as for insurances, credit (see SACCOs in Kenya), AI services, bulk purchase of feeds and minerals, feed manufacturing and analytical services. In 1938 there were almost 1,400 cooperatives in the Netherlands with over 160,000 members (Table 2). Total population in 1893 was 4.5 million against 9 million in 1940.

In 1930, farmer organizations initiated the establishment of Central Laboratories for Soil, Plant, Feed and Milk Testing, due to the strongly felt need to have reliable and actual data to optimize farm management, crop yields and milk production.

Table 2. Number of cooperatives and its members in 1893 – 1938 (the Netherlands).

Year	No of coops	Cooperative members	Total Population
1893	138	6,980	4.5 million
1904	855	56,192	
1920	1,014	119,768	
1938	1,376	163,794	9.0 million

Increased milk production and farm structure

In 1900 milk production was about 2,500 litres per cow but this increased to 4,000 litres per cow in 1950 thanks to breeding activities. Only 2-12 % of the agricultural land was used for fodder crops like legumes and sugar beets and the increase in milk production was importantly based on a fast growing compounded feed and concentrates supply chain. In 1950, still more than 75% of the agricultural farms were smallholder family farms and 27% of the labour force was working in agriculture.

3.1.2 1950-1980: Growth phase

“High government involvement and investment”

Government policy

In this period the Dutch government policy was geared to ensure national food security and to enhance trade and export of (processed) agricultural products to other European states.

In 1952, the Netherlands contributed to the set-up of the precursors of the European Community together with France, Germany, Italy, Belgium and Luxembourg. Finally, in 1967 the European Community was established.

Among others, one of the activities of the European Community was the development of a Common Agricultural Policy (CAP). The CAP goals were to create higher efficiency and productivity in the agricultural/food value chains, to ensure a fair standard of living to the agricultural community, to stabilize markets and to assure the availability of food supplies to EU consumers at a reasonable price. Incentives for farmers to invest in higher production were provided through a system of high base prices of agricultural products combined with import protection and export support.

In the Netherlands this resulted in high government and private investments in innovation and technology development for food production. Large government funding was made available for research (Wageningen University), collecting and publishing sector statistics and economic performance indicators (LEI), practical training centres & farmers extension services (DLV, PTC+, HAS) and so on. Alongside the Dutch government also financed an ambitious and successful programme for land consolidation to create larger farms and economically viable agricultural production units.

Impact on the dairy sector

The effect of this conducive agricultural government policy is exemplified by the statistics provided in Table 3a. The number of farms decreased considerably, but the number of cows as well as milk production increased. Moreover the production of fodder - especially maize silage – gained importance and pasture was partly turned into arable land for fodder maize cultivation.

Feeding rations of cows were highly optimized and consisted of an optimum ration of grass, maize silage and concentrates.

Feed manufacturing cooperatives were established and cooperatives across the chain (milk processing, insurances, credit, AI services and so on) consolidated and merged into larger more efficient and financially robust entities. Mixed farming systems disappeared and were replaced by highly efficient, specialized and mechanized dairy farms.

Table 3a. Characteristics of the dairy sector in the Netherlands during 1950-1980.

Year	Number of dairy farms	Number of cows x1000	Milk-Production Litre x1000	Fodder		
				Grassland x1000ha	Maize x1000ha	Clover x1000ha
1950	216,000	1,518	4,766	1,317	-	24
1960	200,000	1,628	6,068	1,327	-	10
1970	131,000	1,896	7,748	1,334	6	6
1980	87,000	2,356	11,510	1,198	139	2

Table 3b. Effect of introducing milk quota by the EU and other structural adjustments 1990-2010.

Year	Number of dairy farms	Number of cows x1000	Milk-Production Litre x1000	Fodder		
				Grassland x1000ha	Maize x1000ha	Clover x1000ha
1990	65,000	1,878	10,766	1,096	202	6
2000	30,000	1,504	10,734	1,010	205	7
2010	17,500	1,479	11,626	951	231	6

In the 1970s the European Union designed policies to speed up the structural adjustment of the European farming sector. In 1972 legislation was passed to modernise farms, to promote professional training and to “rejuvenate” the agricultural workforce by encouraging older farmers to take early retirement. In 1979 a “co-responsibility” levy was introduced in the dairy sector requiring farmers to pay a penalty for serious over-production in order to stabilize prices. All these policy measures helped to re-structure the dairy sector and the larger agricultural sector.

Commodity or Product Boards

In 1948 the Dutch government approved the Act on Public Law Organisations, which are comparable to the system of Product or Commodity Boards in other countries. A Public Law Organisation is an association of producers and entrepreneurs in the same production or value chain, which are involved in the creation of the same end-product (from raw material to end product). Commodity Boards have a broader scope and membership than industry or trade associations (for a definition see chapter 4 below), for example it would typically have representatives in the board or governing council from various industry associations (e.g. dairy farmers associations, processor associations, feed manufacturing associations, breeders association, workers unions and representatives from relevant government departments).

The Commodity Boards played a crucial role in governing and developing the many agricultural sub-sectors in the Netherlands. The main objective of the creation of these Commodity Boards was to allow private sector stakeholders operating in the same product chain, to establish a policy lobbying platform and be part of policy development, to delegate implementation of government policy and regulatory framework, to introduce self-control mechanisms and introduction of voluntary standards and codes of conduct, to set up training and research for the sector, and to promote all other interests deemed necessary for the proper governance and development of the sector.

In 1960 there the Netherlands had almost 50 Public Law Organisations or Commodity Boards, most of them in the agricultural sector. Important for the dairy sector are the Dutch Dairy Board (“Productschap Zuivel”) and the Animal Feed Board (“Productschap Diervoeder”).

These Commodity Boards:

- Have a mandatory membership from stakeholders across the sector including representatives of government departments;
- Can put out binding conditions to their members;
- Collect levies and cess from their members for financing part of the Boards activities;
- Receive government funding for implementation of both public and autonomous tasks.

The Boards have two main sets of tasks:

- Governmental tasks: execution of governmental tasks at request of the government (usually Ministry of Agriculture), and
- Autonomous tasks: execution of autonomous tasks for the development and competitiveness of the sector.

Examples of both sets of tasks are given in Table 4 below. In Appendices 1 and 2 the functioning of the Dutch Animal Feed Board and the Dutch Dairy Board are summarized.

Table 4. Examples of the functions and tasks of Commodity Boards in the Netherlands.

Governmental Tasks	Autonomous Tasks
Execution of European legislation	Collective promotion
Import and export legislation	Education
Milk quotas	Sector research (statistical, market)
European aid/support	Technical product development and innovation
Common market regulations	Plant and animal diseases
Breeding	Labour market regulation
Execution CAP	Advice and cooperatives

 Development of further legislations

Advocacy

Support services

From 1980 onwards (Maturity Phase)*Improvement entrepreneurship, e.g.**Certification, Quality systems, Chain**Management, Labels/Branding, CSR*

3.1.3 1980-now: Maturity phase

“Market stabilization, chain management and a retreating government after the mid-nineties”

Scaling up and productivity growth of dairy farms

In 1984 the European Community implemented a milk quota system for its member States, which put a ceiling on milk production per country. As a result the total number of cows decreased drastically in the Netherlands from 1980 onwards (see Table 3b above). For example the number of cows in 2000 almost equalled the number of cows in 1950.

However, milk production in 2000 was more than 100% higher than in 1950. In 1950 and 2010 the average milk production per cow was 3,980 and 8,100 litres respectively. Due to e.g. improved breeding practices and enhanced production and preservation of high quality fodder crops and use of concentrates, maximum milk production per animal increased to as high as 12,000 litres/year.

Also the number of dairy farms reduced sharply during this period (1980: 87,000 and 2000: 30,000). This trend continued after 2000 as in 2010 the number of dairy farms had reduced to 17,500. At the same time the scale of the remaining dairy farms increased as the average number of cows rose from 51 in 2000 to 79 in 2011. Average production per farm was 670,000 litres per year in 2010 (total 11.7 billion litres).

During this period great improvements were made in forage production and preservation, which had a significant impact on lowering the cost price of milk. Forages like fodder beets and hay, were replaced by grass silage and maize silage with much higher protein and energy content. This also contributed to higher stability of milk supply across the year. Much attention is paid by the farmers to optimization of the ensilage process and a quick and reliable determination of the concentrate and fodder quality through feed and fodder analysis.

Farm management practices improved significantly over this period due to a base of well-trained and highly skilled dairy farmers, who manage their highly capitalized farms purely as businesses enterprises.

Certification and chain management

In the 1990-ties the agriculture and the feed & food sectors in the Netherlands and other parts of Europe, were confronted with food scandals related to heavy metal pollution, mycotoxins, dioxins and pesticides in raw materials and end products.

This triggered a strong and powerful consumer awareness and lobby for food safety, followed by animal welfare and attention to care for the environment. This in turn created a strong and lasting awareness and concern within retail chains and food processors (as well as insurance companies), of the legal implications and damage that can be done to their brand and profitability (also in terms of claims for damages).

Food safety, animal welfare and responsible use of the environment became increasingly important societal and political issues and agricultural value chain operators were forced to structurally review sustainability of their operations. This in particular also led to systemic changes in the feed sector.

Product or Commodity Boards like the Animal Feed Board responded to this by the development and introduction of self-regulation and certification systems, quality assurance systems (GMP+/HACCP, ISO, BRC, etc.), labels and branding. An important system that got introduced by the Product Board for Cattle and Meat and the Product Board of Poultry and Eggs was the Integral Chain Control system (IKB). The IKB system guarantees the quality of the end-product from “grass to glass” and from “feed to fork” encompassing uniform standards, product labelling and stringent protocols for raw material and end product sampling and analysis. Tracking and tracing systems were developed to control the entire production column, from the origin of the product, the production and processing methods to handling, storage, distribution and retail.

Farmers producing according to this IKB system are obliged to purchase feed/concentrates from feed companies working under GMP+/HACCP (Good Manufacturing or Managing Practice, see also Appendix 1). Although compliance to IKB is not mandatory by law, farmers who do not comply with the IKB system, in practice have no outlet for their farm produce to milk or meat processors, as most of the retailers demand IKB compliance of the products sold to consumers.

In addition to these generic systems put in place and adopted by the Commodity or Product Boards, there are also (eco) labels of private companies. E.g. milk processors in the Netherlands have their own OCM (Organisation Certifications Milk) organized by Qlip.

One of the results of these developments was further consolidation in the agricultural sector and crowding-out of producers, processors and input and service providers that were not able or willing to comply.

Structure of the cooperative sector

Also the number of cooperatives in the agriculture sector decreased due to this consolidation process which was witnessed by a large series of mergers both in the cooperative sector and private operated firms. This was triggered by the need for economies of scale to be able to compete in the market and to counterbalance powerful food processing companies and retail chains.

As a result many of the cooperatives have developed into semi-corporate business organisations run by professionals and highly skilled staff. Some have oligopolistic characteristics as was witnessed by the recent merger between the two largest milk processing cooperatives in the Netherlands, Friesland Dairy and Campina who – as “Friesland Campina” have an annual milk intake of 10 billion litres from 13,000 highly specialised and capitalized dairy farms. This is close to 90% of total milk production in the Netherlands.

Some of the cooperatives have matured and grown into global players with international interests and investments. Examples are (again) Friesland Campina with milk processing factories in Nigeria, Vietnam and Indonesia and an annual turnover of EUR 190 million, Rabobank being the largest agri-business bank in Europe, Agrifirm (feed manufacturing) with factories in Eastern Europe, VION being one of the largest meat processors in Europe (factories in UK) and - in the flower sector - Flora Holland with the largest flower auction in the world. Involvement in the day-to-day running of these “corporate cooperatives” is limited, although farmers are still represented in the board of many of these organisations.

Restructuring of research, practical training and farmer extension services

From approximately 1995 onwards the Dutch government initiated a process of retreating from direct investments and funding to many of the earlier government induced and established institutions. This phase is characterized by a restructuring of the financial and management models of agricultural research, academic and practical training, and farmer extension.

Most of the institutions operating in this field were (semi-)privatised and responsibility for the upkeep of services and its financing is now largely the responsibility of the value chain actors themselves, with the challenge to operate according a (more) commercially driven business model on cost recovery basis.

Restructuring of Product Boards

Equally in 2010, the Dutch Government reviewed the activities, operations, mandates and financial contributions to the Commodity Boards. It concluded that the Act originating from 1948 should be changed. The current position of government is that the public tasks of the Boards (to implement government policy and regulation) should be continued and (partly) paid by government.

However the autonomous tasks shall be carried out by business groups themselves, without involvement and financing by the government. At this moment the process of reduction of the Commodity Board’s tasks has started. However, it is not clear yet how all autonomous tasks will be filled in and financed in the near future.

Table 5 gives a summary-overview of trends and indicators of the dairy sector life cycle phases as discussed above.

Table 5. Trends and indicators of the dairy sector life cycle phases: start up, growth and maturity phase in the Netherlands

Phase	Trends and indicators
“Start-up phase” 1850 – 1950	<ul style="list-style-type: none"> • Low number of cows per hectare; • Low milk production per cow; • Low acreage per farm; • Employment: high labour input per ha; • Mainly family farms with mixed farming systems (dairy next to production of food and fodder crops and other small livestock like pigs and poultry); • Production for own use or sub-national scale, fragmentation of markets and supply chain; • Processing of excess milk mainly on-farm; • Production increase oriented (more farmers/cows);

	<ul style="list-style-type: none">• Low educational level of farmers;• Start-up of cooperatives (production, finance, insurance, processing);• Cost price of milk is relatively high, limited fodder production;• Minor contribution to GDP;• Restricted or limited government intervention.
“Growth phase” 1950 - 1980	<ul style="list-style-type: none">• (Inter-)nationally orientation;• High government policy intervention and funding for research, knowledge development and other enabling environment issues.• Scaling/specialisation/intensification;• Organised milk processing, defragmentation of supply chain;• Productivity increase oriented;• Efficiency oriented;• Mechanization level increases;• Outflow of agricultural labour to agricultural support services and other economic sectors;• Strong growth of cooperative sector ;
“Maturity phase” 1980 - now	<ul style="list-style-type: none">• (Inter-)national/global orientation;• High consolidation of production and scaling up of dairy farms;• High productivity, efficiency and commercial orientation;• Breakthrough in fodder production and reduced cost price of milk;• Well-educated farmer base;• Chain management, high attention for quality issues, food safety;• Growing attention for animal welfare and environment;• High contribution to GDP ;• Retreating government, increased sector self-control, financing.

4. KENYAN DAIRY SECTOR: SYSTEM ANALYSIS AND MATURITY INDEX

4.1 System analysis: ecosystems

To get a better understanding of the structure of Kenyan dairy sector – and how structure impacts upon growth - the concept of system analysis is used in this chapter. This concept differentiates ecosystems which are defined as: groups of actors that have comparable characteristics, activities and objectives. An ecosystem may consist of one or more sub-ecosystems and is usually part of one or more upper-ecosystems. A system analysis shows the positioning and interactions between sub-ecosystems and upper-ecosystems (and within ecosystems).

In this chapter, the Kenyan dairy industry is a collective term for the dairy farmers, input suppliers (e.g. feed and breeding companies), buyers of raw milk (e.g. farmers’ owned milk collection and bulking enterprises (CBEs), dairy processors, but also milk traders), domestic consumers, the Kenya government and the global market (consumers and foreign regulatory bodies).

In the system analysis approach the dairy industry is defined as an ecosystem with the stakeholders depicted in the circles below operating as separate sub-ecosystems (figure 3).

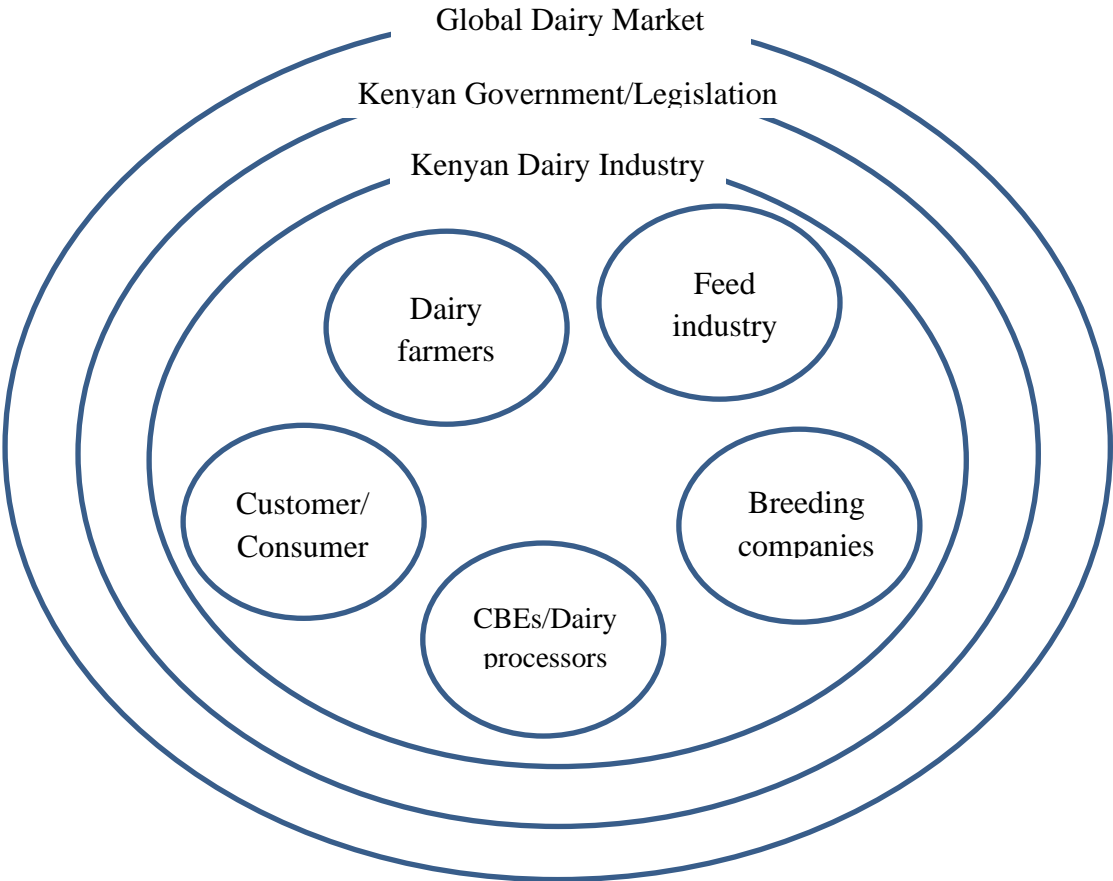


Figure 3. Simplified overview of the Kenyan dairy industry as ecosystem including its sub-systems (dairy farmers, feed industry, breeding companies, CBEs, dairy processors and consumers)

Figure 3 is a simplified illustration of the position and interaction of the dairy industry ecosystem with its sub-ecosystems and the upper-ecosystems that constitute government/legislation and the global dairy market. The interaction and communication between the ecosystems follow some general rules:

- Rule 1: Outer circles or upper-ecosystems are more dominant than inner circles hence the dominance goes from the outside to inside.
- Rule 2: Interaction takes place within an ecosystem and between ecosystems. Interactions are more effective and sustainable when the MI levels of the interacting parties are similar.

The most outer circle represents the global dairy market. Interaction (export of products) by the Kenya dairy industry with this ecosystem is bound to compliance with strict, robust and compulsory quality standards. This can hardly be influenced by the Kenyan dairy industry ecosystem and its composing sub-systems, as it is a matter of compliance or denial of entry.

In the recent past, the influence of the global dairy market on the dairy sector in Kenya was negligible. Therefore Kenya government was the “most outer circle” and dominant. Nowadays with the ambition to export dairy products, the sector is confronted with demands from the global dairy market on e.g. international trade, composition and nutritive value of dairy food and products, etc. The Kenyan government (and its underlying ecosystems) has to react on the demands and criteria of the global dairy market, which involves implementation and enforcement of new legislation on international trade and monitoring of product quality. If not, products of the Kenyan dairy sector will be denied entry into the global dairy market.

At national level and with regards to the domestic market, the Kenyan government (second circle) has the mandate for regulation and development of the Kenya dairy and feed industry and is therefore the dominant actor. This is done by investments to create an enabling environment for the industry to grow, by legislation to regulate the industry and its sub-sectors, and through policies regarding import of dairy products and foreign investments in the industry.

In more developed economies, increasingly the mandate of government for sector regulation and the ability to fulfil it effectively is being “driven” by the market: buyers of animal feeds, retail chains and consumers of milk and meat have high awareness and priority for food safety and quality. In mature economies, consumer lobbies that effectively influence public awareness, policy makers and regulators on sector issues and chain management form a strong lobby, forcing producers and processors to restructure their business operations and go into self-regulation. Even over and above minimum standards set by national governments.

The same governments have raised standards and enforcement through high pressure from public opinion. It is expected that in Kenya – with a fast growing middle class and easy access to international publications on food safety – a similar trend will be witnessed in the coming years.

4.2 Maturity Index (MI)

In the system analysis approach, the existence and effectiveness of interactions within and between ecosystems is assessed using the concept of Maturity Index (MI). The MI is an index which indicates the relative maturity level of a company, a group of companies or an ecosystem.

The MI usually increases with reduced fragmentation and integration of value chains and markets, skills and knowledge, enhanced efficiency and economies of scale, sector governance and sector-wide acceptance of - and compliance with - minimum standards for production facilities, production processes and end-products. Hence sector wide introduction of HACCP and ISO systems. In livestock sectors with a high MI, systems for integrated chain management (e.g. in the Netherlands: IKB) are in place, which control quality from “grass to glass” (dairy industry), from “seed to feed” (feed industry) and from “feed to fork” (meat industry).

Breaking down a sector in producers of goods and services, consumers and regulators the following may be stated.

For producers, service providers and input suppliers, the MI can be defined as the sum of a set of parameters that determine the ability of actors in a particular value chain to deliver products and services consistently and competitively, in compliance with the demands from the market and the standards and codes of conduct set by the regulatory environment and the sector itself (the latter through self-regulation).

For the market or the users of products and services, the MI can be defined as the desire and ability to demand for quality products at competitive prices, and to have a high level of control and means of verification of the same, through consumer and lobby organisations.

For government as a regulator and creator of conducive enabling environment for sector growth, the MI index is related to the ability to design, implement and enforce policies, standards and regulations that govern the sector in the long term interest of both society at large and the value chain actors. This interest is usually understood as creating sector competitiveness, attracting private sector investment, creating employment and assuring food security and safety for the country’s citizens.

The MI is an indicator for the level of operations of the actors in the system, their behaviour, preferences, ambitions, operational practices and processes in place, their business propositions, targeted markets and – based on this – their ability to achieve their objectives.

Parameters that determine MI levels are for example:

- Knowledge & awareness
- Skills & expertise
- Level of technology & mechanisation
- Organisational capacity (as a company and as a sub-ecosystem)
- Quality of product and/or service
- Financial strength and access to means of production (e.g. land)
- Level of integration.

The table below shows varying Maturity Indices for the stakeholders in the Kenya dairy sector as discussed in chapter 2.

Table 6. Simplified overview of MIs in the Kenya Dairy sector

Stakeholder/Actor	MI Low	MI Medium	MI High
Smallholder dairy farmers	xx		
Medium/large scale commercial dairies		xx	x
CBEs (farmers owned Collection & Bulking)	xx	x	
Cottage industries	xx		
Small/medium sized processors	x	x	
Large processors (Brookside e.g.)		x	x
Processors high value added niche products		x	xx
Hawkers and milk traders	xx		
Milk bars	xx		
Dukas	x	x	
Supermarkets		x	x
Low income BoP consumers	xx		
High and middle class consumers		x	x
Large animal feed manufacturers (e.g. Unga)		x	x
Informal feed sector	xx		
Importers/distributors semen		xx	x
Inseminators	xx	x	x
Laboratory services		x	
Training institutions	xx		
Industry associations (KDPA, AKEFEMA, KDFF, KENDAPO, DTA)	xx		
Government Ministries,, KDB, KEBS	xx	x	

This table is a simplification of the actual situation on the ground. In general terms the conclusion that can be drawn from the previous two chapters, is that the MI in the dairy and feed sector on NW Europe is high, whereas the MI of most of the actors or stakeholders in the Kenyan dairy and feed sector is low to medium, depending on the segmentation of the sector.

The MI index is lowest when looking at the segment of semi commercial smallholder dairy farmers who sell excess raw milk in the local community to end- consumers. The MI is highest in the segment of dairy farmers that are fully commercialized and sell milk to (high MI) processors based on quality parameters, that produce value added products for the high-end domestic and international market, with the ability to comply to highest quality standards. The same applies to the feed manufacturing industry that is characterized by feed manufacturers with varying MIs that produce for different market segments.

Sector growth and efficiency is hampered by the fact that the Kenyan feed and dairy sectors are characterized by actors and ecosystems that are bound to interact and/or compete on basis of different MIs, which is compounded by weak government structures and MI for regulation and spearheading development of the industry.

The following are some examples of the variance in MI levels in the Kenya dairy and feed sectors:

- A large section of consumers have low awareness of food safety and low ability to purchase processed milk. The consumer market has therefore a low MI. Hence the existence of a large raw milk market with traders and consumers operating at a structurally lower MI index, as compared to respectively processors and middle class urban consumers. Milk processors have difficulties to interact with this sub-ecosystem and in fact are subject to (to an important extent unfair) competition by the same.
- Within the sub-ecosystem of processors, MIs differ according to the products and customers targeted. Processors operating in niche markets for high value-added products that can compete on quality with international suppliers, have a different MI than processors that operate only in the domestic liquid milk market segment. Processors driven by quality parameters of raw milk and end-products, find it difficult if not impossible to interact and buy milk from smallholders and traders who cannot comply with minimum standards for raw milk.
- Smallholder dairy farmers with a low MI have difficulties to produce year round milk at low cost, and therefore form increasingly a barrier for processors that need to compete on price in the domestic and international market.
- Feed manufacturers with high MI that produce high quality concentrates and dairy meals have difficulties to access markets of smallholder farmers. Many of these farmers with low MI have insufficient knowledge of feed rationing and feeding regimes and eventually resort to sub-standard - but cheaper - products from low capitalized and unskilled feed producers with low MI. The latter usually do not comply with minimum standards set by government, but due to low enforcement levels are able to crowd-in and cause unfair and unhealthy competition with companies with a high MI.
- Importers of semen with high MI rely often on AI service providers with low MI - especially in the smallholder market segment. These smallholders with low MI in turn do not have the knowledge and ability to critically assess the quality of service by the AI service provider.
- The MI of the global dairy market is relatively high. Modern technologies, knowledge and skills are used and applied. In contrast, the MI of the Kenyan government is medium/low in regard to regulatory environment and legislation. This may hinder design and enactment of new legislation and quality assurance systems that are acceptable for the global dairy market.
- International markets with high MI require certificates from internationally accredited laboratories for testing of milk and animal feeds. Results from local labs with low MI are not compliant with international standards and entry of products in such markets is denied.

5. SECTOR INTEGRATION AND CONVERGING MATURITY INDICES

The message that is derived from the previous chapter is that long-term meaningful interaction between different actors in the dairy and animal feed value chain, will only be achieved by actors that have similar or converging MIs. This calls for a common vision of the private and the public sector on how to bridge these differences in MIs and work on sector integration. This also implies that deliberate policies and strategies need to be designed and implemented to strengthen those segments and stakeholders in the sector, that have the highest ability to transition the industry into a growth model.

This dispensation of actors in the dairy and the feed industry with different MI indices makes long term meaningful cooperation, integration and consolidation difficult, if not in some cases impossible. To make the comparison with the Dairy Sector Life Cycle that was discussed in chapter 3, a large segment of the Kenyan dairy and feed industry and their clients/consumers, are footed in the start-up phase, whereas other parts are in the growth phase. Some actors in certain sub-ecosystems have entered the maturity phase, but this does not apply to entire sub-ecosystems.

This is the landscape of almost all agricultural supply chains in Kenya, especially those who produce for the domestic market. The situation is different in (parts of) the supply chains of industrial crops like tea and coffee, horticultural export crops and the flower industry. These sub-sectors all produce for international markets, have to compete internationally on price, and need to comply with international standards for quality. But increasingly also on Corporate Social Responsibility (labour conditions of employees, use of the environment and so on). Here the international market is to a large extent the driver for integral chain management and the alignment of MI levels of the constituent parties or actors in these value chains.

However this global market driver (outer upper ecosystem) is still largely lacking in the agro value chains that target the domestic market, which requires the public sector to act more vigorously and take more responsibility for both governance and development of these sectors.

5.1 Government's role

It seems paramount that in such unstructured/fragmented and volatile supply chains like the dairy and feed industry, government takes up a leading role in putting structures and systems in place that set out the path for integration, consolidation, efficiency and productivity shifts, and which are required for strong and competitive milk, meat and other animal product supply chains to ensure access to safe and affordable food stuffs by a fast growing urban population.

This requires a paradigm shift in the structure of agricultural supply chains and the thinking on the role of government. The larger part of the Kenya dairy industry, and other domestic food supply chains, is somewhere half-way the transition process from start up to growth. Examples of international best practice for sector regulation/development, should therefore not be sought in the current dispensation of international economies that are in maturity stage, with a retreating public sector, but must be benchmarked against the systems that were put in place in these economies during the time of transformation from start-up to growth.

A lesson that can be learned from the NW European/Dutch Dairy Sector Life Cycle is the strong role of government in both policy making and regulation of the sector and sector development, during the transition from start up to growth phase. A period that covered about 50 years.

Key for the development of the Dutch dairy sector was the large and long lasting government funding of research, education, training en extension services across the value chain. Until a point was reached (starting from the late-nineties) that the sector reached a high level of maturity and government decided that it could safely retreat. This is illustrated in the figure below.

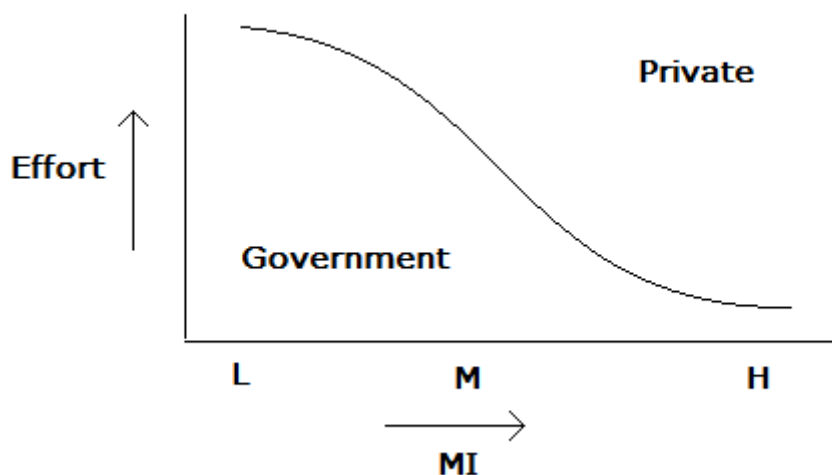


Figure 5. Relative extent of investment in knowledge/skills by both the government and the private sector during the development of the MI of a sector or company.

In view of the low skill and knowledge level in the dairy and the animal feed sector (which contributes to low Maturity Indices), there is a strong case for the Kenya government to review its position on allocating (minimal) funds to training and extension. This rethinking and repositioning should preferably take place through partnerships and support to private sector-driven and commercially operated (semi-) autonomous training institutes or centres. Exemplary for this need for a paradigm shift is the case of the Dairy Training Institute in Naivasha. As a government institution it has not been able to keep up with the demands for skilled labour and appropriate training by the sector, but instead is now a run-down training centre with dilapidated infrastructure and curricula that are not in line with the demands from the industry. Yet there is a ready market to pay commercial rates for a wide variety of short and long courses, provided the quality of training meets the demands.

Another area that should attract great concern from government is the need and demand from stakeholders willing to invest in the dairy and feed sectors, to enhance sanity and level playing field, through a harmonized and updated system of legislation, regulation and enforcement of minimum standards, codes of conduct, sector wide introduction of GMP/HACCP systems, and so on. This would include tracking and tracing systems and compulsory testing at prescribed intervals of raw materials and end products, based on clear and transparent protocols.

Private companies are not responsible for legislation and enforcement, and thus this cannot be left to the private sector through half-hearted attempts of self-regulation only. The more so in the absence of sector maturity (converging MI levels) and strong consumer platforms that can expose and crowd-out unprofessional, unskilled and - not seldom - unethical business enterprises. Instead it needs a strong and efficient government apparatus or, preferably, well-funded and equipped private-public institutions for sector governance. This is the more important in view of Kenya's ambition to be an exporter of dairy products.

In addition, Kenya lacks proper testing facilities that are internationally accredited and can credibly analyse on a wide scope of parameters. This is a third area of concern where government likely needs to step in and facilitate.

5.2 Value chain actors (private sector)

Whilst government can be seen as the value chain *enabler* and the upper-ecosystem in figure 3 above, the sub-ecosystems in figure 3 contain the value chain actors (farmers, farmer owned CBEs, processors, input suppliers and service providers, consumers and so on).

These value chain actors should start working together in cooperatives, associations and other sector organisations to enhance efficiency in operations, reduce fragmentation, develop a common vision and increase their bargaining power towards the government. It is only then that government will be confident and willing to share and delegate responsibility for sector governance with the private sector, and vice-versa for the private sector to mobilise more government funding for sector development.

As was described in chapter 3, key in the NW European Dairy Life Cycle was the organisation of value chain actors into cooperative societies for both production related activities (vertical integration) and input supply and services, including finance (horizontal integration).

In addition to the creation of a strong cooperative sector, industry associations were formed and public-private institutions (Productschappen or Commodity Boards) were established, that were granted delegated mandate to regulate and develop the sector. This created a powerful platform for lobbying with national government for conducive policies and financial support to sector development. As a result, next to mandatory membership and membership contributions (levies), value chain actors managed for decades to mobilize and sustain structural central government funding for development of the sector. Again key to this was the development and adoption of a common vision on sector development.

This two-pronged approach – a willing and pro-active government and a robust unified lobby and strategy platform from within the sector - assured strong institutionalized public-private interaction and cooperation on all aspects of sector governance and development. This is an essentially different scenario as compared to the ad-hoc consultations between a “retreating” government and a “fragmented industry” as is generally the case in Kenya.

Figure 4 below gives an illustration of the types of entities that evolved over time in the Netherlands to organise and unify the value chain actors and to achieve meaningful private-public sector cooperation and sector governance. This resulted in the following organisations.

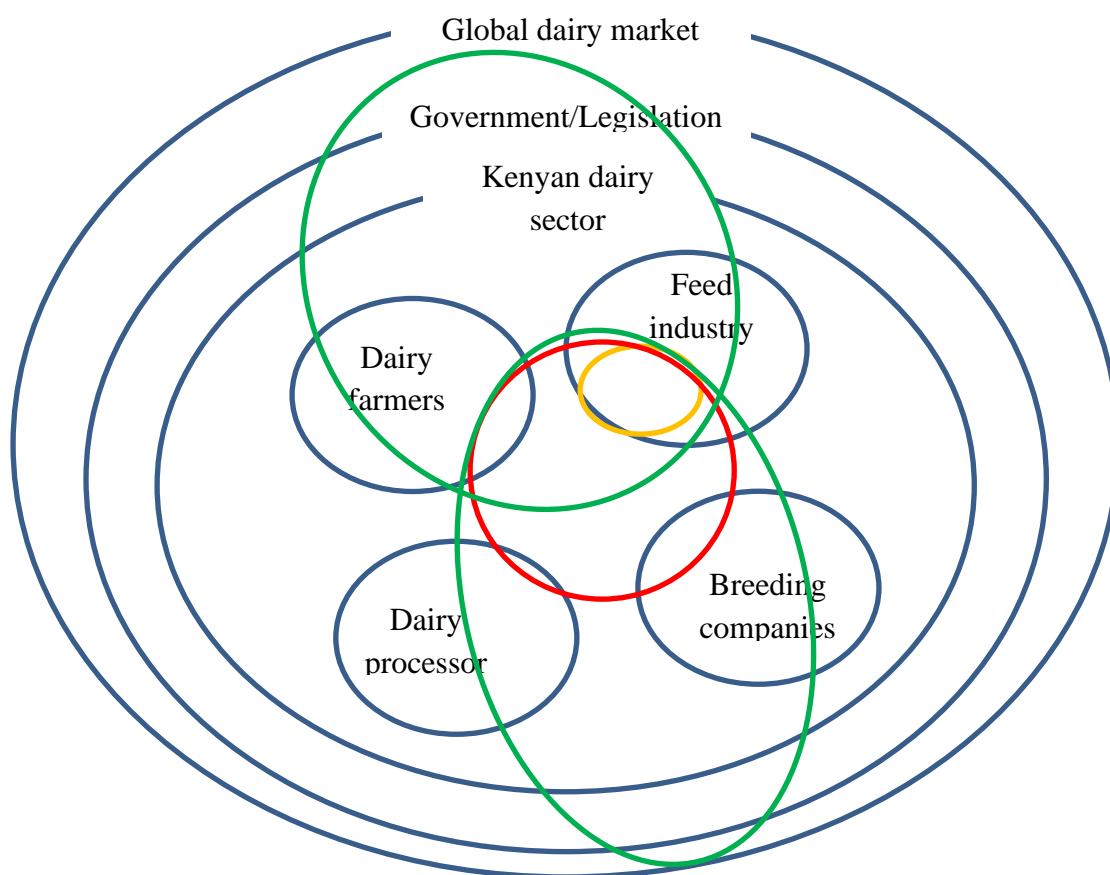


Figure 4. Illustration of different forms of organisation in the dairy sector. Yellow = cooperative, blue = industry association, red = trade association and green = commodity board.

Step A (Yellow): Cooperatives

Cooperatives are usually farmer owned organisations that engage in business activities to serve the economic interest of the members. Examples – not limited to Kenya – of cooperatives can be found at all levels: milk collection, bulking and marketing enterprises (CBEs), milk processing, animal feed production, AI services, financial services, farmers insurances and so on. The cooperative sector is particularly strong in the Netherlands.

Step B (Blue): Industry associations

In Kenya an industry association is usually defined as a membership organisation of stakeholders that operate in one and the same sub ecosystem or part thereof. Examples are the Association of Kenyan Feed Manufacturers (AKEFEMA), the Kenya Dairy Processors Association (KDPA), the Kenya Dairy Farmers Federation (KDFF), the Livestock Genetics Society (LGS), the Dairy Traders Association (DTA), the Kenya Dairy Producers Organisation (KENDAPO), the Kenya Livestock Breeders Organisation (KLBO) and so on. PPD Consult concluded in a recent policy study on the Kenyan dairy sector (2013) that the capacity of most industry associations is weak.

Step C (Red): Trade or Sector Associations

A trade or sector association is an organisation that connects and brings together stakeholders from different sub ecosystems that form part of an upper eco system, and are engaged or contribute to the production of certain value added goods, such as milk or meat.

For example, a dairy trade association involves dairy farmers, breeding companies, the feed industry, milk processors and so on. The stakeholders in such trade associations differ in role and business activities but they all contribute to a common goals and vision: e.g. a competitive dairy sector. Cooperatives and industry associations (steps A and B) are usually members of trade associations to assure that the interest and views from their membership are well represented.

In Kenya that are no examples of a trade or sector organisation as defined and described here.

Step D (Green): Commodity Boards

Resembles a trade association but in addition the government is involved. Examples in the Netherlands are the Dutch Dairy Board and the Dutch Animal Feed Board. These are autonomous organisations with delegated responsibility to develop and implement policies, standards and regulations, to impose levies and other retributions from the sector and to finance activities and services for sector development. Membership is not voluntarily, for example all companies active in the Dutch animal feed industry are a member of the Dutch Animal Feed Board (compulsory).

Although Kenya has a similar dispensation of Commodity Boards, their mandate and functions are essentially different from those in the set-up of Commodity Boards in the Netherlands. The Kenya Dairy Board (KDB) to some extent resembles the Dutch Dairy Board, however unlike the Dutch Commodity Boards, KDB is a government organisation (parastatal), whereas the former are autonomous, with a much wider mandate for regulation, enforcement and sector development, and a broader representation from the industry stakeholders. In chapter 3 the functions of the powerful Dutch Commodity Boards was described, whereas Appendices 1 and 2 give a summary of the operations of respectively the Dutch Animal Feed Board and the Dutch Dairy Board.

It may be of interest for the Kenya Dairy Board and the Ministry of Agriculture, Livestock and Fisheries, to look in detail in the functioning and operations of the Dutch Dairy Board and the Product Board Animal Feeds and their role and functions during the transition from growth phase to maturity. For the animal feed sector in particular, this dispensation of Commodity Boards (i.e. the Dutch Animal Feed Board) could fill the vacuum that exists in Kenya, with on one hand disengaged government organs for policy making and regulation and fragmentation of the same, and on the other hand an industry association (AKEFEMA) that is – by design - weak, internally divided, underfinanced and without proper mandate (e.g. for compulsory membership and levying feed manufacturers).

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 General

In chapter 3 the business life cycle concept was used to describe business and sector development in the Dutch dairy sector covering a period of almost 100 years from start to maturity. This transition was driven by strong farmer-organisation in cooperatives, which consolidated and merged over time, and sector forums (e.g. trade associations), and by a pro-active government willing to invest in enabling environment (training, research, governance) and shared responsibility with the private sector for policy development and regulation. The latter culminated in the creation of private-public Product or Commodity Boards like the Dutch Dairy Board and the Animal Feed Board. It was argued that “Productschappen” or Commodity Boards as per the Dutch model could be a valuable example or tool for the development of the Kenyan sector.

In chapter 4, system-analysis and the concept of Maturity Indices were introduced to unravel further the structure of the Kenyan dairy and feed sectors. Compared to the situation in the mid-20th century in the Netherlands (i.e. the start of the growth phase), the Kenyan dairy sector is much more heterogeneous. For example, when the sector in the Netherlands entered into the growth phase and sector institutions like the “Productschappen” were established, the dominant role of a global dairy market was absent, technology level was still relatively low, and the sector already had witnessed the emergence of a strong cooperative sector and consolidation of farms from smallholder to medium sized units. Moreover the MIs of value chain actors were all at a similar level. This implied that the development of the dairy sector could develop gradually.

In Kenya the landscape is different with value chain actors that have strongly diverging MIs and a sector structure that – as a result – is highly fragmented and has disconnected internal markets. At the national level the enabling role of government is rather weak, which is witnessed by fragmentation of the policy and regulatory framework, low investment in skill development, inability to create a level playing field and so on. In addition, contrary to the situation in the mid 1950-ies in NW Europe, interaction with the international level and exposure to foreign investors, new technologies, quality standards and competition is relatively high.

The situation at the start of the growth phase in the Netherlands - and NW Europe at large – was therefore different from the more complex and heterogeneous situation in present day Kenya. Yet some lessons can be learned and recommendations made.

Role of Government

The first set of recommendations is related to the role of government. In the NW European Dairy Sector Life Cycle the role of government was crucial for transitioning of the dairy sector from start-up (low MI) to growth (medium MI) and maturity (high MI). In particular with regard to:

- Knowledge development and transfer, and
- Sector regulation and governance.

As was argued in the previous chapter, this requires a pro-active rather than a retreating government, and strong properly financed and equipped sector governance institutions with clear mandate.

To ensure that the private sector plays its role as investor, engine for employment and producer of high quality affordable products and services, government should give the private sector a meaningful role in structure development, implementation and enforcement of legislation. This makes the concept of “Productschappen” or Commodity Boards as per the Dutch model an attractive proposition to further scrutinize for its applicability and adaptability to the Kenyan context.

In this dispensation – and related to sector regulation and governance - it seems inevitable that government also deals with two other prominent issues:

- a) Milk and feed (product) quality, and
- b) Informal markets.

As for milk quality, this is not an issue that is confined to the informal - raw milk - market. There is need to beef up quality by the processing industry as well. Not only for accessing the international market, but also on the premise that consumer awareness is on the rise in the domestic market and the public interest for food safety.

Naturally, processors have responsibility to self-regulate their own operations and the industry. On the other hand – as was mentioned before - government needs to set basic standards for the industry and by doing so create a credible base that applies across the industry, for benchmarking and enforcing compliance. Both the dairy, but probably and even more so, the feed industry are largely unregulated as regards to production processes and standards of buildings, equipment, minimum skills requirement of personnel and sourcing of raw materials. With regards to the dairy industry the enactment of the Kenya Dairy Industry Regulations is however long due.

As for the animal feed sector, a capital intensive animal feed industry that does not comply with international best practice of product labelling, and with the majority of companies lacking GMP or HACCP systems to guide their operations, is unthinkable in more developed economies. Not to speak of the many “jua kali” businesses that have at some point in time decided to try their luck in animal feeds and opened up shop without any knowledge of feed formulation and quality control. Entry barriers are extremely low in this sector and a barrier for credible segments in this sector to grow and compete. Setting clear minimum standards and putting systems in place for regular site inspection and enforcement of standards is a government task. And this also applies for putting in place a road map with sector players on how to get there. This simply cannot be left to the market for self-regulation.

Thus, with regard to the informal markets in the food and feed processing chains, government needs to adopt a clear vision on how to transition to more formal channels, or at least to create a level playing field for the formal chain. As for the raw milk market this requires a clear strategy of phasing out. The ambition to build a strong dairy processing industry that spurs domestic socio-economic development and is expected to compete internationally (Vision 2030), requires government to make strategic choices and to act accordingly. Current policies seem not to coincide with this ambition, as in the absence of credible attempts to curb the raw milk market, the recent introduction of VAT on pasteurized and UHT liquid milk, is expected to act counterproductive and puts the cart before the horse.

Role of the private sector

A second pillar and recommendation for sector development that was discussed in chapter 4, calls upon the private sector - including smallholders and large scale dairy farmers - to organise itself in cooperatives, meaningful industry associations, trade associations and other sector forums, as means to bring efficiency, economies of scale, sanity and order in the sector. It was argued before that industry associations should work on self-regulation and put their house in order.

Admittedly – as is explained above - this will be fast-tracked if the market demands this and when government develops, inspects and enforces effective standards for the dairy and feed industry. Standards that not only target end-products (i.e. being KEBS compliant), but which scope covers business operations as well. As is for example the case with the Dairy Industry Regulations and (other) GMP/HACCP-like QC/QA systems.

There is however space and need for pro-active engagement of private sector players as well for self-regulation and developing a common vision. This equally applies to KDPA, AKEFEMA and LGS, just to name a few examples of private sector membership organisations.

At a higher organisational level - and rather than resorting to single-issue based and driven industry associations - stakeholders in the dairy sector should come together to lobby government for conducive policies and appropriate funding and facilities for sector development. For example for internationally accredited laboratories for milk and feed testing, training institutions for the dairy and the feed sector, and so on. This does not only apply to the vertical chain of milk producers, processors and retailers, but also to feed manufacturers, the AI sector and other input suppliers and service providers. For example, rather than AKEFEMA lobbying for reduced import tariffs on raw materials (including yellow maize), they should form a lobby with farmers, processors, AI distributors and inseminators (and even consumers of animal products), to support their case.

In this respect it seems also evident that CBEs have to cluster and consolidate in order to create economies of scale in operations for enhanced efficiency. Farmers and their producer organisations are in principle a massive force and if joined together can take processing and marketing of their milk, the provision of animal feeds, AI services and financial services in their own hands.

6.2 Feed and fodder sector

To conclude this report, some observations and recommendations are made and summarized for enhanced structure in the feed and fodder sectors.

Feed sub-sector

The feed sector in Kenya is characterised by a number of capital intensive professional feed manufacturers (medium to high MI) that are located in the larger cities (Mombasa, Nairobi, Nakuru, Eldoret and Kisumu). They largely rely on by-products from food agri-processing industries, whereby protein rich by-products are mainly sourced from neighbouring countries in the East Africa Community or are imported from India and other international markets (in particular soy). Few of these supply chains – if any – and the companies themselves are GMP/HACCP certified. As a result QC/QA of supply chains is low, whereas labelling of end-product indicating the nutritive composition is lacking. A number of dairy cooperatives have also gone into feed manufacturing and large scale dairy farmers mix their dairy meals through direct purchase of raw materials.

Next to this more professional segment in the industry, there are many small “underequipped and unskilled” business enterprises that are engaged in mixing and bagging of organic by-products and waste products and sell this as animal feed of unspecified origin and content.

Sub-report III gives an overview and analysis of the main issues and bottlenecks in the feed sector from a policy point of view. The feed industry in Kenya is confronted with several MI problems and action should be taken to address these:

- Government legislation and support are weak and fragmented. This impacts upon the sector in many ways. One is low year round access to quality raw materials due to import duties and issues around import of yellow maize, partly because of the absence of a strong domestic supply chain for raw materials (energy and protein rich crops).
Another area is the lack of, what could be called, an Animal Feed Production Regulation, setting minimum standards for feed manufacturing enterprises in terms of premises, equipment, QC/QA systems and certification, skilled staff, labelling of end-product and so on. Entry barriers are very low in this sector crowding in informal sector and undermining minimum standards and level playing field.
- The lack of an internationally accredited feed testing laboratory is a serious bottleneck. Independent, credible laboratories should be created to ensure the quality of animal feed and fodder via regular testing and analysis.
- In the absence of a pro-active and strong government policy and regulatory framework, AKEFEMA (Association of Kenya Feed Manufacturers) was a creation by government to stimulate the feed industry to self-regulate the sector. AKEFEMA however is a voluntary membership organisation with divided membership and no mandate to levy contributions, develop policy and standards, and enforce those. It is entirely underfunded and - by design - lacks capacity to bring sanity and order in the sector.
- Leading animal feed manufacturers could cooperate by introducing a programme for comprehensive internationally accredited GMP/HACCP system for their factories and products, staff training and product branding. They could also join forces to create and operate jointly a commercially operated internationally accredited feed laboratory, in a partnership or joint venture with an international laboratory. Opportunities for co-financing through international Public-Private-Partnership donor programmes – preferably with a strong training component - could be explored.
- The concept of an Animal Feed Board that brings together all policy, regulatory and sector development issues in one institution could be a way out for the systemic bottlenecks that are plaguing the industry. Such an institution should be governed by all major stakeholders in the sector like Government, AKEFEMA, farmers’ associations (dairy, meat, poultry), animal products processing industry (e.g. KDPA), consumer platforms. The Dutch Animal Feed Board could serve as an example of such an institution. Appendix 1 gives a short description of the tasks and functions of the Dutch “Productschap Diervoeder”.

Fodder sub-sector

The fodder sector in Kenya is an emerging sector but only a handful of (semi-) professional mechanised commercial fodder producers can be found with medium MI. Hay and Lucerne are the main products, but there are also farmers who have specialized in selling maize silage. Some CBEs have gone into commercial hay production on leased land.

By-products from agro-processing industries are bought by farmers and CBEs which are located near to the major cities, for example high protein rich brewer's waste or energy rich pineapple pulp. None of these supply chains – whether hay, Lucerne, maize silage or by-products from agro-processing industries are quality controlled. Yet there is large scope to optimize these supply chains through best practice technologies and management that can be imported from other countries.

Sub-report VI gives the trends in the Kenyan Fodder sub-sector, whereas sub-report VII shortly summarizes the trends in the fodder sub-sector in the Netherlands.

Lessons learned from other more mature dairy economies show that fodder or forage, in combination with agro-processing by-products and proper valorisation and preservation of these fodders, forms the backbone of sector competitiveness and growth. Quality energy and protein rich fodder can give milk yields of 22 litres per day, without any additional feeding with concentrates that is much more expensive.

There is high potential for expansion and optimization of commercial fodder supply chains across the chain from introduction and use of high yielding variety seeds, increased production per hectare, improved mechanisation and preservation, enhanced nutritive value and appropriate technologies for logistics and distribution. Benchmarking with fodder crop production in the Netherlands and other countries with a developed dairy and fodder sector (e.g. South Africa) is recommended. Investment in innovation, knowledge and skills for commercial mechanised fodder production, are considered by this study as some of the most strategic and important intervention-choices for the Kenyan dairy sector.

APPENDIX 1. PRODUCTSCHAP DIERVOEDER (ANIMAL FEED BOARD)

The Product Board Animal Feed is a statutory regulatory industry organisation. It was established at the request of the Dutch feed industry (Product Board here equals the term Commodity Board used elsewhere in this report). See: <http://www.pdv.nl/english/organisatie/index.php>

The task of the Product Board is to serve the public interest and the common interest of the companies and employees in the entire production column. The Board was established to govern the Dutch feed sector and includes NEVEDI (representing the feed manufacturers and the Dutch equivalent of AKEFEMA), HISFA (association of traders in fodder and agro by-products), the organisation of producers and traders of animal feed raw materials, livestock keepers being the buyers of feed and fodder products (dairy, beef, poultry, pig farmers associations) represented by their farmers organisations (LTO) , trade unions (FNV, CNV) representing the employees working in the production column for animal feeds and fodders, and the cooperative sector association.

The Board consists of representatives of each of these private sector organisations and unions, complemented by representatives of the Ministry of Agriculture (now a department of the Ministry of Economic Affairs) and the Ministry of Public Health.

The board is advised by the Social Economic Council (SER), the general umbrella organisation for statutory regulatory industrial organisations. A representative from SER also sits in the Board.

The private sector organisations finance the Product Board Animal Feeds through levies and other mandatory contributions from their members and a contribution from government.

Platform function

The most important task of the Product Board Animal Feed is the fulfilment of a so-called platform function for all the stakeholders in the feed column or chain. Discussion and coordination of common interest issues forms the basis for the implementation of a common vision and policy. In addition, the Board promotes harmonisation between the feed manufacturing sector and the subsequent actors in the animal feed supply chain.

Main functions

The main functions of the Product Board Animal Feed are:

1. Strategic platform for the entire feed column or value chain
2. Provision of services to the stakeholders within the feed column, with respect to expertise and information, research, promotion and (administrative) implementation of activities.
3. Regulatory competence and standardization of quality.

The activities which arise from these main functions are currently incorporated in the following programmes:

- I. Feed quality and safety (e.g. introduction in the nineties of GMP/HACCP in the feed column)
- II. Setting uniform feed value parameters
- III. Employment and working conditions
- IV. Innovation and development
- V. Provision of information and structured sector communication
- VI. Co-governance tasks as delegated and mandated by the Dutch government

Animal feed legislation

The Product Board Animal Feed was set up for animal feed legislation in the Netherlands in which there are generally binding rules for companies.

The Dutch animal feed legislation is largely a translation and implementation of rules which are set at the EU level. This is sometimes called 'co-governance'. The co-governance tasks are carried out for and under the responsibility of the Ministry of Agriculture, Nature and Food Quality (now a department under the Ministry of Economic Affairs). In addition the Product Board has independently laid down a number of regulations in the animal feed legislation over and above EU standards (autonomous task).

Drawing-up animal feed legislation

Animal feed legislation in the Netherlands – whether it is derived from EU legislation or contains additional autonomous Product Board Regulations – is drawn up by the Animal Feed Product Board in accordance with standard procedures. Draft Regulations are prepared in consultation with legal and policy staff from the Product Board. When converting EU legislation, the EU Regulation is of course the basis.

The draft Regulation is harmonised by a Policy Advice Committee of representatives from the private sector, after which it is published in the Bulletin of the Social Economic Council. Any interested party may request or demand for adjustments and appeal within a one month period. These objections or proposals for amendments are assessed by the relevant authorities and either accepted or rejected with due motivation. The (new) draft Regulation is then submitted to the Product Board and - if passed - it must be approved by the Social Economic Council (SER). In the event of EU legislation that is passed into Dutch law, the Regulation must also be approved by the relevant Ministry (usually by the Minister of Agriculture, Nature Conservancy and Fisheries or the Minister of Public Health, Welfare and Sports). There after the new Regulation will be published in the Regulations Bulletin of the SER and becomes effective. To implement the new Regulations the Product Board may develop and adopt decrees which do not require prior announcement or approval by the SER or the Minister. In the event of designing national Regulation or decrees which are not directly derived from EU legislation, the Netherlands should make a notification to the European Commission and the other member States, before the new Regulation become effective. The EU and the Member States will amongst others check whether the new Regulation involves any unlawful impediment to existing trade agreements between member States. The Minister and the SER can only approve the new Regulation when there are no objections from European Commission and the member States. As of then the new Regulation becomes effective.

GMP and GMP+ (HACCP)

GMP (Good Manufacturing Practice or Process) as a QA and QC system was first developed and adopted in the Dutch feed supply chain in 1992. It started as a voluntary system of self-regulation by the sector under the Animal Feed Board, but soon it became de-facto mandatory as processors and retailers of products from animal origin, demanded that the producers of milk, meat and eggs to use GMP certified animal feed .

This was called Integral Chain Management (IKB, see chapter 3 above). The GMP system for the animal feed sector, which includes raw material suppliers and transporters, was managed and

audited from 1992 up until 2009 by the Product Board Animal Feed in The Hague. In 2000 the system was upgraded to comply with the scope of the internationally recognized HACCP system and renamed as GMP+. From 2012 onwards, the scheme is managed by GMP+ International.

The GMP+ Feed Safety Assurance Scheme (GMP+ FSA) assures feed safety in all the links of the animal feed value chain. It is also an international accredited scheme that is applicable worldwide. Sector wide introduction of the scheme was primarily the result of demand from the companies/ stakeholders in the animal feed value chain for enhanced control for feed safety.

A key factor for fast tracking introduction and acceptance of GMP+ FSA was the occurrence of a number of incidents with contaminated meat, eggs and milk, that could be traced-back to animal feed (dioxin, aflatoxins). Other factors that initially also contributed to voluntary introduction of GMP and GMP+ were related to branding of products based on quality attributes to find a marketing advantage in a – by that time - saturated European market for animal products.

From the late nineties onwards, feed and food safety have become major issues in European markets. Both feed manufacturers and the agro-processing industry have been forced by the market (consumers and retailers) and government, to certify complete value chains from “feed to fork” and from “grass to glass”. The basic principle of the GMP+ FSA scheme is that the animal feed chain is part of the human food production chain. Food safety has now become a worldwide issue and large multinationals have seen huge negative impact on business operations, in cases where they have been associated with contaminated food products. Examples are the 2009 melanin case in China and the recent contamination of baby milk powder, again in China. This news travels around the globe within 24 hours and affects the operations of a multinational firm worldwide. Both politic establishments and consumer markets increasingly expect that feed and food processing companies take responsibility for Quality Assurance & Control across the value chain. The GMP+ Feed Safety Assurance scheme is a powerful tool to realise this.

Animal Feed Sector Good Practice Guide and the Hygiene Code

The Animal Feed Hygiene Regulation EC 183/2005 became in force as per 1 January 2006. This Regulation made application of HACCP principles mandatory for all animal feed companies within EU member states, excluding primary agricultural production.

In order to be able to comply with the legislation, this Regulation offers animal feed companies the possibility of applying a so-called Good Practice Guide. This Guide is also known as the Hygiene Code. The Hygiene Code may be submitted for an entire sector. The government then assesses the Code and approves it or not. The approval can take place as well on national level as on European level. If approved the Code complies and is mandatory for the *entire* (sub-) sector. By working with an approved sector wide applied Hygiene Code, audits by VWA (Food and Consumer Product Safety Authority) can take place more quickly and more efficiently.

Dutch Hygiene Codes

The GMP+ Certification Scheme for the Animal Feed Sector 2006 contains all the elements necessary for a Hygiene Code (and more than that). The GMP+ (equivalent to HACCP) standards can therefore serve as the basis for any additional codes which are being submitted. If desired by its members, the Product Board Animal Feed submits additional Hygiene Codes to the government for the animal feed column. Hygiene Codes differ in scope according to the operations of the stakeholders in the

production column. For example traders in minerals, pre-mixes and other feed ingredients (raw materials, have a different Hygiene Code as compared feed manufacturers. Transporters have their own Hygiene Code, and the same applies to traders in agro-processing by-products and forages.

The provisions of each of these Hygiene Codes are derived from the GMP⁺ standards and based on the statutory provisions of the Animal Feed Hygiene Regulation. The aim is to obtain approval for the Hygiene Codes from the Ministry of Agriculture and then apply it sector wide to the various segments in the production column.

Benefits for companies which are GMP⁺certified

GMP⁺certified companies already comply with the statutory provisions of the Animal Feed Hygiene Regulation through participation in the GMP+ Certification Scheme for the Animal Feed Sector 2006. As was stated in the previous section, the scope of certification can be different depending on the company's operations and end-products. For each company under GMP+ this is published on the Product Board's website in the so-called GMP⁺/Hygiene Code cross-reference table. This table shows which provisions from the Hygiene Code have been included in its GMP⁺ standards. The GMP⁺-certified companies can use this to show, in the event of a Food and Consumer Product Safety Authority audit, that they are compliant with the requirements of the Animal Feed Hygiene Regulation through their GMP⁺-certification. This allows for minimum depth and repeat audits by the Food and Consumer Product Safety Authority.

By working in accordance with the Hygiene Code companies can demonstrate to the competent Authority that they work in accordance with the statutory provisions of the Animal Feed Hygiene Regulation. The Hygiene Code is therefore not without commitment. The Code obliges the user to implement it and to apply it unless companies decide on the setting up and application of their own HACCP plan or a GMP system which is at least equivalent. By working with the Hygiene Code the VWA (Food and Consumer Product Safety Authority) audit of companies can take place more quickly and more efficiently.

APPENDIX 2 PRODUCTSCHAP ZUIVEL (DAIRY BOARD)

The Dutch dairy sector

The Dutch Dairy Board (PZ) operates on behalf of the Dutch dairy sector. Around 20,000 dairy farms produce more than 11 billion kg of milk, with in total 1.5 million dairy cows and 0.2 million dairy goats. Approximately 55% of agricultural land in the Netherlands is used for dairy farming.

The bulk of the milk is processed into cheese (52%), butter, powdered milk, condensed milk, fresh milk products and speciality products by 52 dairy factories. A small proportion of the milk is used for on-farm processing.

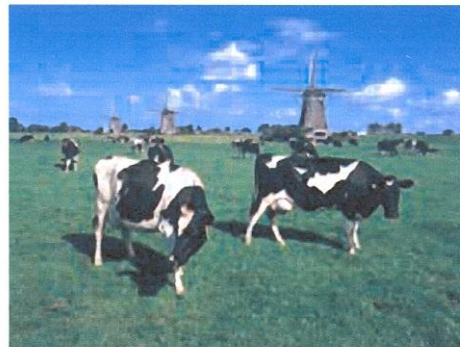
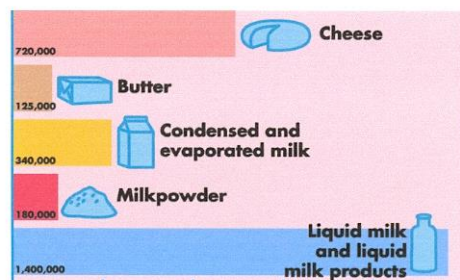
Geographical distribution of milk production



In the whole sale trade about 200 specialised companies are active, many of them worldwide. Almost 6,900 retail outlets are involved in trade in dairy products. The dairy sector as a whole provides 61 thousand jobs.

The breakdown of the consumption of Dutch dairy products is as follows: the Netherlands 40%, other EU countries 40% and non-EU countries 20%.

Production of (x 1,000 kg)



Organisations

Legislation relating to statutory organisations such as the Dutch Dairy Board has been in place since the 1950s. This was the period following the Second World War when the Netherlands was rebuilding its social structure and there was a general consensus that added value could be achieved by collective efforts. The Dutch Dairy Board was established in 1956.

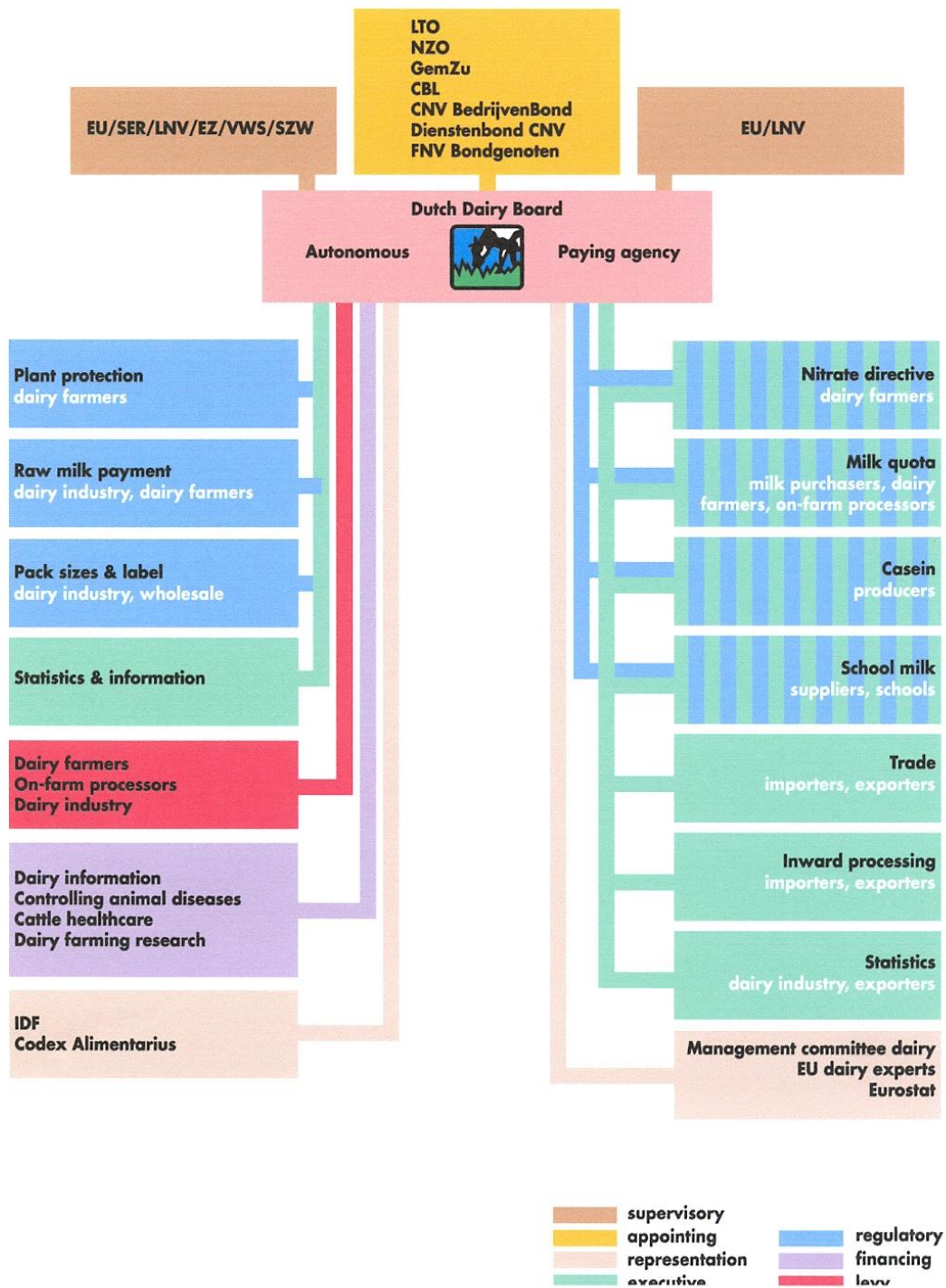
The Dutch dairy sector is highly organised, each segment in the production chain having its own organisation to represent its interests.

Within the Board the farmers are represented by the Dutch Association for Agriculture and Horticulture (LTO), the dairy industry by the Dutch Dairy Association (NZO), traders by the Joint Dairy Federation (GemZu) and the retail by the Dutch bureau for Provision Trade (CBL). The trade unions FNV Bondgenoten, CNV BedrijvenBond and Dienstbond CNV represent the workforce.



In the field of milk quality assurance, control and animal health some specialised organisations are active on instruction of the Board: the Netherlands Controlling Authority for Milk and Milk Products (COKZ), Qlip and the Animal Health Service Dierenarts (GD).

Relations and activities Dutch Dairy Board





Dutch Dairy Board

The Board of Governors of the Dutch Dairy Board includes representatives of employers and employees from every segment of the Dutch dairy sector, covering dairy farming, the dairy industry and the wholesale and retail trade in dairy products. The president is appointed by the Crown and has an independent position. The Board has a workforce of almost 70 employees.

The Board has regulatory powers. This means that the Board can impose regulations with which all dairy farmers, dairy processors and traders must comply. Levies are imposed to finance promotion, research, animal healthcare and quality projects.

In addition to serving as a platform for discussion of developments in national and international dairy policy, the Board also acts as an information and knowledge centre for the dairy sector in the Netherlands. The information available includes market and price data, regulations and production and trade statistics.



The Board is also accredited by the Ministry of Agriculture, Nature and Food Quality (LNV) as a delegated body of the national paying agency, responsible for the implementation of the majority of European Union market regulations relating to the dairy sector. Examples of these are the superlevy regulations, the import and export regulations for dairy products and the subsidy for school milk. In implementing these regulations, the Board provides the sector with added value by supplying the requisite information and giving

Departments

Policy Affairs

Facilitates dairy farming and cattle healthcare research, is fully involved in developments relating to quality control in the dairy sector and dairy food legislation and initiates labour-related studies in close co-operation with employers and trade unions in the dairy sector.

Information

Collects, analyses and presents data relating to the dairy sector, both in the Netherlands and abroad. The information available includes data on markets and prices, regulations and production and trade statistics. Reporting is either in a standard format or on a more trailer-made basis.



Market Regulations

Implements regulations relating to the import and export of dairy products. The department evaluates and processes applications for export refunds, issues import and export licences and implements the regulations on inward processing relief and those with regard to seagoing vessels and aircraft. The department has a help desk for queries relating to veterinary trade restrictions.

Implements the milk quota regulations and a number of subsidy regulations. The department evaluates and processes quota transactions, registers individual milk quotas and imposes superlevy. The department also implements the regulations on subsidies with respect to school milk and casein, imposes the levies and is involved in the determination of the urea content of milk, related to the implementation of the nitrate directive.



Finances Dutch Dairy Board

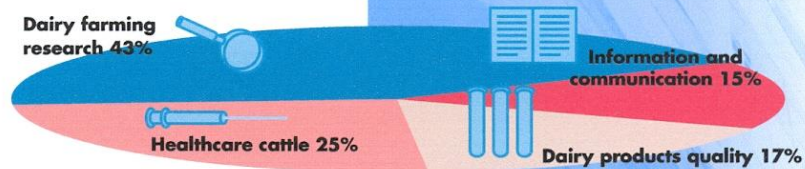
Autonomous activities

Activities under the independent control of the Board are financed by one general and various specific levies imposed on dairy farmers, on-farm processors, dairy goat farmers and the dairy industry. The levies (amounting to approximately € 13.5 million in 2009) are used to finance activities relating to information, research, animal health and quality projects. The Board's operating costs make up approximately 13% of the total expenditure on autonomous activities.

Dutch Dairy Board levies; breakdown

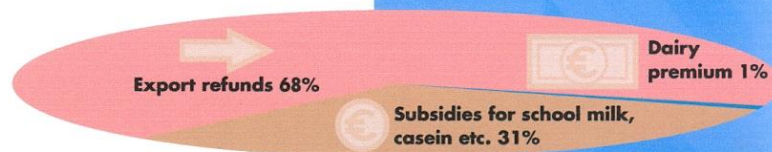


Dutch Dairy Board levies; allocation



Paying agency

Operating costs associated with implementation of European market regulations are reimbursed by the Ministry of Agriculture, Nature and Food Quality. In 2008 the turnover on payments related to EU-financed export and support measures was approximately € 3.4 million. The Board's annual operating costs amounted to € 5.5 million.

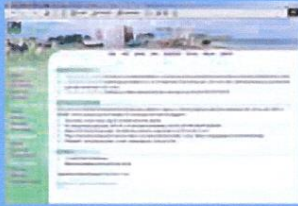


The amount related to the milk...

Information

Internet Dutch Dairy Board

www.prodzuivel.nl



The Dutch Dairy Board web site provides:

- Policy and accountability of the Board
- General dairy information (latest news, sector information, publications, links)
- Statistics (production, trade, consumption, prices/quotations of dairy products)
- Regulations (Board circulars, EU regulations)

Contact

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Market Regulations	+31-79-3681662	+31-79-3681950	mr@pz.agro.nl

Organisations

CBL	Dutch bureau for Provision Trade	www.cbl.nl
CNV	National federation of Christian Trade Unions	www.cnv.nl
COKZ	Netherlands Controlling Authority for Milk and Milk Products	www.cokz.nl
EU	European Union	www.europa.eu.int
EZ	Ministry of Economic Affairs	www.minez.nl
FNV	Netherlands Trade Union Confederation	www.fnv.nl
GD	Animal Health Service Deventer	www.gddeventer.com
GemZu	Joint Dairy Federation	www.gemzu.nl
INV	Ministry of Agriculture, Nature and Food Quality	www.minlnv.nl
ILO	Dutch Organisation for Agriculture and Horticulture	www.ilo.nl
NZO	Dutch Dairy Association	www.nzo.nl
PZ	Dutch Dairy Board	www.prodzuivel.nl
Qlip	Quality assurance in the dairy chain	www.qlip.nl
SER	Social and Economic Council	www.ser.nl
SZW	Ministry of Social Affairs and Employment	www.minszw.nl
VWS	Ministry of Health, Welfare and Sport	www.minvws.nl

