

Study on the Kenyan Animal Feed and Fodder Sub-sectors

Kenya Feed Industry Policy and Regulatory Issues

(Sub-report III)

ABS TCM Ltd.



September 2013

Part of the “Kenya Market-led Dairy Programme” (KMDP) of

SNV/Kenya Netherlands Development Organisation



ACRONYMS

AFMA – Association of Feed Manufacturers (South Africa)	KEBS – Kenya Bureau of Standards
AI – Artificial Insemination	KENAS – Kenya National Accreditation Service
AKEFEMA – Association of Kenya Feed Manufacturers	KEPHIS – Kenya Plant Health Inspectorate Services
AMREF – African Medical and Research Foundation	KEPOFA – Kenya Poultry Farmers Association
ASCU – Agricultural Sector Coordination Unit	KES – Kenya Shilling
BSE – Bovine Spongiform Encephalopathy	KIPPRA – Kenya Institute for Public Policy Research and Analysis
COMESA – Common Market for Eastern and Southern Africa	KMDP – Kenya Market-led Dairy Programme
DAHLD – Department of Animal Health and Livestock Development (Malawi)	KRA – Kenya Revenue Authority
DLP – Director of livestock Production	MoLD – Ministry of Livestock Development
DVS – Director of Veterinary Services	MoPH – Ministry of Public Health
EAAPP – East Agriculture Productivity Project	MoT – Ministry of Trade
EAC – East Africa Community	NBA – National Bio-Safety Authority
EU – European Union	NLP – Kenya National Livestock Development Policy
FAO – United Nations Food and Agriculture Organisation	NEMA – National Environment Management Authority
FDA – Food & Drug Administration	PVC – Polyvinyl Chloride
GDP – Gross Domestic Product	QA – Quality Assurance
GMO – Genetically Modified Organisms	SABS – South Africa Bureau of Standards
GMP – Good Manufacturing Practices	SADC – Southern Africa Developing Countries
GOK – Government of Kenya	SAZ – Standards Association of Zimbabwe
HACCP – Hazardous Analysis Critical Control Point	SNV – Netherlands Development Organisation
KDB – Kenya Dairy Board	SOQ – Seal of Quality
KDSCP – Kenya Dairy Sector Competitiveness Program	TCDD – 2,3,7,8-TetraChloDibenzo-p-Dioxin
	UK – United Kingdom
	WHO – World Health Organization

TABLE OF CONTENTS

ACRONYMS	1
EXECUTIVE SUMMARY	5
1. INTRODUCTION.....	7
1.1 Manufactured animal feeds and livestock production in Kenya	7
1.2 Inadequate enforcement of regulations.....	7
1.3 Ingredient supply chain constraints.....	8
1.4 Efficacy and quality of animal feeds and ingredients	8
1.5 Animal health and consumer safety	8
1.6 Effect of unplanned economic liberalization on feed quality	8
2. LIVESTOCK (ANIMAL) PRODUCTION SECTOR.....	10
2.1 Challenges and opportunities in the dairy sector	10
2.2 Purpose of this study and problem statement	11
3. POLICY AND REGULATORY FRAMEWORK OF THE FEED INDUSTRY	12
3.1 Overview of the policy and regulatory framework.....	12
3.2 Nature of Feed Supply Chain	14
3.3 Standards and Quality Control.....	15
3.4 Legal framework	15
3.5 Regulatory Institutions for the Feed Industry.....	16
3.6 Institutional Roles and Assignments.....	17
3.7 Overview of policy recommendations from previous reports.....	17
3.7.1 Institutional recommendations	18
3.7.2 Legislative-based recommendations	18
4. PUBLIC HEALTH CONCERNS	19
4.1 Food and human health concerns	19
4.1.1 Bacteria and viruses	19
4.1.2 Mycotoxins.....	20
4.1.3 Heavy metals and Agro-chemicals	20
4.1.4 Genetically modified organisms (GMOs)	20
4.1.5 Danger of dioxins, denatured oils and pesticides	21
4.1.6 Advent of novel feed and antibiotic products use.....	21
4.2 Food safety related studies in Kenya	21

4.3 Recommendations	23
4.3.1 Imports of feed ingredients and feed products	24
4.3.2 Disclosing animal feed nutrient contents and labelling for traceability	24
4.3.3 Sampling and testing protocols and laboratory facilities	24
5. KENYA FEED INDUSTRY COMPETITIVENESS	25
5.1 Cost of raw materials	25
5.2 Availability of raw materials and end products	25
5.3 Porters Competitiveness Diamond	26
5.3.1 Detailed analysis – Feed Industry Porter’s Five Forces	26
5.3.2 Threats of new competition (both local and foreign)	27
5.3.3 Threats of substitutes or new products	27
5.3.4 Bargaining power of suppliers and buyers	27
5.3.5 Threat of new competitors	28
5.3.6 Intensity of competitive rivalry	28
5.4 Benchmarking minimum standards and government systems in place	31
6. THE ROLE OF AKEFEMA IN KENYA ANIMAL FEED INDUSTRY	37
6.1 History of AKEFEMA	37
6.2 Willingness of AKEFEMA members to build capacity	37
6.3 AKEFEMA achievements	38
6.4 Targets/priorities	38
6.5 Weak Leadership and Governance Structure	38
6.6 Financial constraints	39
6.7 AKEFEMA Member SWOT analysis and action plan	39
7. SUMMARY ON KEY INFORMANT INTERVIEWS	42
7.1 MoLD	42
7.2 Ministry of Public Health interview	43
7.3 Tegemeo	43
7.4 KEBS	44
7.5 KEPHIS	45
7.6 KIPRRA	45
8. DISCUSSION AND RECOMMENDATIONS	47
8.1 Kenya commercial feed quality gap – the weak link	47
8.2 Legislation	48
8.3 Suggested way forward in the administration of the Kenya feed industry	48

8.4 Self-regulation of Animal feed manufacturers	49
8.5 AKEFEMA’s mandate and objectives – the misunderstood role.....	50
8.6 Building confidence and perception on feed quality and safety	51
8.6.1 Feed analysis laboratories.....	51
8.6.2 Feed procurement based on certificates of conformity	52
8.7 Building raw material supply chain efficiencies.....	52
8.8 Feed manufacturers insurance	52
9. REFERENCES	53
APPENDICES	55

List of Tables

Table 1: Farm level milk production cost share (% and KES/litre)	11
Table 2: Summary of the main Kenya animal feed policy and regulatory framework	13
Table 3: Summary of policy and regulations in selected sub Saharan countries	32
Table 4: AKEFEMA Members SWOT Analysis.....	40
Table 5: Key Informants, Organization and Designation	46
Table 6: Criteria for the five Star rating	56
Table 7: Revenue and expenses projections.....	57

List of Figures

Figure 1: Aflatoxin levels (ppb) in different feed types in Kenyan feeds between years 2007 – 2009	23
Figure 2: Feeds supply/value chain issues	29
Figure 3: Kenya feed industry Porters competitiveness diamond.....	30
Figure 4: Suggested Organization Chart for AKEFEMA Secretariat.....	55

EXECUTIVE SUMMARY

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 below. This document is sub-report III which aims at understanding the policy and regulatory environment for manufactured animal feeds.

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

No	Title	Author
I	Summary report	BLGG Consortium
II	Kenya 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

Sub-report III documents current knowledge of Kenya’s feed industry operations, policy and regulatory issues and the perceived role of the Association of Kenya Feed Manufacturers (AKEFEMA). Issues discussed include practices in manufactured feeds and livestock production in Kenya, inadequate enforcement of regulations, feed ingredient supply chain constraints, efficacy and quality of animal feeds and ingredients, feed and food safety and the effect of partial liberalization of the feed sector on regulation of feed quality.

The Ministry of Livestock Development (MoLD) and other government agencies regulate the feed industry (enforces Acts of Parliament). Some Acts relevant (direct or indirectly) to the animal feed industry are listed in the Introduction of this report.

The mandate to regulate feed quality is mainly with the Kenya Bureau of Standards (KEBS) and MoLD.

Reforms of the 1980s led to industry liberalization, but no strategic steps were taken to ensure this step-wise exit from public authorities. Fragmentation of the regulatory framework and the bodies mandated to regulate and limited financial resources in both public (MoLD, KEBS) and private sector (AKEFEMA) appear to prohibit an integrated approach to effective legislation and enforcement.

Kenya imports over 70% of the raw materials needed for manufacturing animal feed, the bulk of which consists of grain and oil seed cake by-products. It is extremely difficult to purchase high quality inputs and fraud is common. Although feed product standards have been defined, they need review so that they conform to nutrient requirements of existing improved livestock breeds.

The standards for the quality of raw materials are inadequate, thus making it difficult to enforce controls on the quality of by product raw materials imported to the country.

Problems related to the poor competitiveness of the Kenya livestock industry include:

- Inadequacy of accredited feed analysis laboratories for good manufacturing practices;
- Lack of knowledge by both feed manufacturers and producers on importance of feed purchase agreements that demand certificates of conformity to standards;
- The weak feed subsector regulatory framework. KEBS has a lot of challenges in its effort to control the fraudulent feed manufacturers in the industry;
- Access to reliable and quality raw materials at competitive (world market) prices (ingredient supply chain constraints).

Options for improvement are presented by comparing industry competitiveness and benchmarks of the Kenya feed regulatory framework against that of the Southern Africa Developing Countries (SADC) and the South Africa feed industry. The need for a strong industry governing institution and its role in regulating the feed sector, especially regarding licensing, good manufacturing practices and feed quality control are highlighted. The role of AKEFEMA to date and its ability to engage and self-regulate the feed sub sector is discussed. Views of public and private sector key informants were used to formulate the recommendations on the way forward. AKEFEMA members are willing to play a key role of feed industry self-regulation, however it may not be the right body to regulate and develop competitiveness of the sector.

Based on this sub-study it is recommended that:

- a) The feed sub-sector stakeholders (KEBS, MoLD, MoPH, MoT, Policy Research Organizations, AKEFEMA, producer organizations, private laboratories and other relevant institutions) organize a joint platform to discuss the current state of the feed industry and interventions necessary to address constraints of the raw material supply chain, feed laboratories for quality control, establishment of feed manufacturer's registration, licensing and enforcement of good manufacturing practices.
- b) Follow-up on the status of the new feed policy and bill, which has been drafted with support of AKEFEMA. Interest by AKEFEMA to this bill is that it should be a member of the ministerial advisory board that would, among other things, make recommendations for licensing of the feed millers.
- c) To explore the need for - and functions of - an Animal Feed Board in line with models that historically emerged in Western countries (e.g. The Netherlands) some decades ago, to address a similar fragmented as well as low skill/regulated animal feed industry.

1. INTRODUCTION

1.1 Manufactured animal feeds and livestock production in Kenya

The term 'animal feeds' refers to a diverse range of feed items including feed ingredients, feed additives, pet foods, ruminant and non-ruminant feeds, and feeds for fresh water and sea fish, birds, dogs and cats and other companion animals. Essentially, manufactured feeds for animals were introduced to increase livestock productivity. With the improvement of animal genetics in terms of production, feed quality has to be carefully designed to match the demands of an animal and enable it to reach its genetic potential regarding production. To this end, manufactured feeds should be of a consistent quality concerning nutritional value and feed safety, that is constantly monitored through scientific measurements. The growth of the middle class in the national population has led to an increase in demand for livestock-derived food products such as milk, meat and eggs. Invariably, faced with limited land size to expand livestock enterprises, this demand increase has to be met by improved livestock productivity which largely hinges on efficient use of feed. Feed currently accounts for 60 to 70% of livestock enterprise production costs.

1.2 Inadequate enforcement of regulations

The Kenya animal feed industry is currently constrained by a multitude of issues, many of which are historical. Currently, the feed industry operates in an uncompetitive environment that urgently needs attention. Issues of concern include inadequate enforcement of regulations, ingredient supply chain constraints, consumer safety and efficacy and quality of animal feeds and ingredients. Ironically, most of these issues are adequately addressed in the existing legislation "Fertilizer and Animal Feeds Act 345" of 1967, which has been revised in 1980 and updated by the Ministry of Livestock Session Papers on National Livestock Policy in 1981 and 2008.

The Ministry of Livestock Development and other government agencies regulate the feed industry (enforces Acts of Parliament). Some acts relevant (directly or indirectly) to the animal feed industry are:

- The Standards Act (Cap 496)
- The Dairy Industry Act Cap 336 (1958),
- The Fertilizer and Animal Food stuff Act Cap345 (1967)
- The Meat Control Act Cap 356 (1972)
- The Prevention of Cruelty to Animals Cap 360 (1962)
- The Pig Industry Act Cap 361(1945)
- The Animal Diseases Act Cap 364 (1905)
- The Veterinary Surgeons Act Cap 366 (1953) recently revised
- The Public Health Act (Cap 242)
- The Food, Drugs and Chemical Substances Act (Cap 254)
- The Animal Diseases Act (Cap 364)
- The Pharmacy and Poisons Act (Cap 244)
- The Agriculture Act (Cap 318)
- The Factories Act (Cap 514)
- The Companies Act (Cap 486)
- The Trade and Licensing Act (Cap 497)
- The Trade Descriptions Act (Cap. 505)
- The Environmental Management and Coordination Act (Cap 8) (1999)
- The Seed and Plant Varieties Act (CAP 326)
- The Customs and Excise Act (Cap. 472)

- The Weight and Measures Act (Cap.513)
- The Plant Protection Act (Cap.324), and
- The Kenya Revenue Authority (KRA) (Cap 469).

1.3 Ingredient supply chain constraints

The Government of Kenya has placed emphasis on improving productivity of livestock from as early 1970s through the 1980s. As a result of many factors including budgetary constraints and subsequent collapse of government livestock services and problems in grain markets and in dairy and meat industries as a result, the livestock sector was liberalized in the 1990s. This resulted in collapse of the vibrant dairy cooperatives of the 1970s and 1980s, which had a domino effect on supporting industries. At the same time, talented personnel left and extension was constrained by economic structural adjustment programs of the Government. These factors led to raw material supply chain constraints.

1.4 Efficacy and quality of animal feeds and ingredients

Kenya feed industry does not have adequate standards for ingredients and quality control of the by-products and ingredients that are imported for the feed industry. Lack of accredited feed analysis laboratories to ascertain raw material chemical composition has also contributed to poor feed quality.

1.5 Animal health and consumer safety

Over the years, inclusion of products known as production enhancers or growth promoters and medicated feed products into animal feeds has increased markedly. Recently, feed additive use has attracted consumer concerns with regard to their safety on animals, organoleptic quality of products from animals fed with additives, and potential human health hazards. There are reports on the risks posed to human and animal health from using growth promoters in animals (FAO 2004). Literature review show that currently Kenya has no regulatory framework for medicated feeds. Food safety through feed safety has become a global priority, and hence Kenya should adopt the global feed and animal quality standards. Pets are an integral part of the feed production chain, and hence are by no means excluded. Their role and importance equally demands safe, good quality feeds.

1.6 Effect of unplanned economic liberalization on feed quality

Reforms of the 1980s led to feed industry liberalization but no strategic steps were taken to ensure step-wise exit from the surveillance by the public authorities. Liberalization was not complete and consequently reforms are still continuing through revision and formulation of the relevant policies and legislature. Despite liberalization, some semi-governmental institutions continue to impose levies, .e.g. KDB dairy KSh. 0.20 per litre cess, KEBS 0.2% feed levy and KSh 20 per unit of imported genetics. While these institutions continue to charge levies on the livestock sector activities, the feed manufacturing industry does not collect levies to support self-regulation which would go a long way to ensure quality in marketed animal feed.

Considering the emerging international and the Kenya feed safety and quality requirements, the current Kenya feed industry legislation and policies are inadequate. It is, therefore, critical for animal feed issues to receive renewed attention from both the government and private animal feed industry stakeholders for Kenya livestock products to serve the national demands and compete regionally and internationally. Competiveness will be determined by production costs, product quality that is partly based on access to safe feed, and ability to efficiently scale up production.

This report discusses issues that can serve as a guide to developing a framework for up-to-date legislation for animal feeds and feed industry self-regulation that can guarantee good manufacturing practices, competitive feed products and safety to humans and animals.

2. LIVESTOCK (ANIMAL) PRODUCTION SECTOR

The livestock and companion animal (pet) sector is an integral part of the Kenyan economy. It contributes to poverty alleviation and food security. Specifically, the sector provides animal proteins, raw materials for agriculture and allied industries, employment, and foreign exchange. In addition, livestock also serves as a store of wealth, and provide draught power, organic fertilizer for crop production, and means of transport (Katherine et al. 2008). Furthermore, it has been recognized that products c.q. yields from dairy, poultry and small-stock enable poor households to get out of the poverty cycle (AKEFEMA 2012). Apart from the benefits from meat and milk producing livestock/animals, companion animals (pets) provide company and protection to humans.

The livestock sector contributes about 12% to Kenya's Gross Domestic Product (GDP) and 40% to the agricultural GDP. Dairy industry contributes 3.5% to the total GDP of Kenya and employs 50% of the agricultural labour force. The Kenyan dairy sector, with an estimated dairy cattle population of about 4.3 million (extrapolated from results of the 2009 census), is one of the largest and most modern in Sub-Saharan Africa. It is the single largest agricultural sub-sector in Kenya. It has grown at an average growth rate of about 4% per year ⁽¹⁾ in the recent past (Ministry of Livestock Development, 2010).

The dairy value chain presents a great opportunity to address poverty and food security in Kenya. More than 1.2 million smallholder farmers are engaged in dairy production, selling about 3 to 5 litres of milk per farmer per day (FAO/Tegemeo 2011). However, shortages, poor quality and high cost of feed concentrates remain a key impediment to growth of the dairy sub-sector in Kenya. Underfeeding of dairy cattle, particularly in the smallholder production system, limits exploitation of their full milk production (genetic) potential.

2.1 Challenges and opportunities in the dairy sector

The dairy sector's supply chain requires improvement, especially in the support services such as the feed milling and the supplies which are needed to support the adoption and use of good quality dairy cattle genetics. The business environment, particularly for animal feed, is characterized by an inadequate regulatory framework, lack of robust self-regulation by the Association of Kenya Feed Manufacturers (AKEFEMA) and a concentration of feed mills in only some limited peri-urban locations. Dairy farmers' productivity is low due to inadequate use of quality feed and forage. Interlinked with this is that quality feed is costly. Another factor contributing to low productivity is shortage of appropriate knowledge and skills for dairy production by smallholder farmers. Milk production efficiency is largely determined by feed type and quality, and feeding strategies.

Feed constitutes 60-70% of the total dairy production costs (Table 1). Ideal feeding enables a cow to achieve its genetic potential with respect to milk production. This is particularly true in the case of high quality genetic breeds derived from artificial insemination (AI).

¹http://www.indexmundi.com/kenya/gdp_real_growth_rate.html

Table 1. Farm level milk production cost share (% and KES/litre).

Breeding A.I.	Feed	Water	Animal health	Other labour	Cattle housing	Farmer margin	Total
2%	66%	5%	5%	8%	3%	11%	100%
0.6	19.8	1.5	1.5	2.4	0.9	3.3	30

(Technoserve chain 2004 modified by Makoni)

Although many dairy farmers invest in good quality genetics, their dairy productivity is constrained by the poor feed and, consequently, its low utilization. It is estimated ⁽²⁾ that only 50% of farmers use dairy concentrates to boost production. Feed is a key driver in dairy production and both its quality and quantity determine the productivity and consequently profitability of dairy enterprises. In addition, feed is useful in application of new innovations and modern technology to optimize animal productivity (MoLD, 2009).

The quality of both concentrate/commercial and fodder feeds has remained an issue of concern to the livestock sector. Variation in milk quantity and quality is often attributed to variation in quality of feed (Muriuki *et al.*, 2003). This variation is relatively high in smallholder farms since their management is more sensitive to price variations. For these farmers especially, access to information on best feed production and management practices is at best inadequate if not lacking at all. All this contributes that even adopting high quality dairy cattle do not reach their full production potential.

Modernization of the feed milling industry to enhance feed quality and competitiveness should be a top strategic priority for improving dairy farmers' productivity and income. This should be accompanied by an appropriate regulatory framework on feed quality. The AKEFEMA can play the role of developing appropriate standards, encouraging feed millers to conform to quality feed manufacturing practices and assisting farmers to be informed about the importance of feed quality and feed management in order to realize the potential engendered by quality genetics.

2.2 Purpose of this study and problem statement

This desk study intends to establish policy and regulatory issues affecting the livestock feed sub-sector in Kenya by reviewing current studies on the feed industry. The study will benchmark the present feed standards and government systems in Kenya for quality assurance against recognized international standards and, ultimately, present recommendations for the Kenya feed industry. In addition, the roles and objectives, particularly promotion of feed industry self-regulation, of the AKEFEMA will be evaluated.

As stated above, concerns have been raised about the Kenya Feed Industry's ability to self-regulate animal feeds and thus guarantee competitive livestock production and food safety. The study will also evaluate the competitiveness of the Kenya Feed Industry itself, as a driver for growth and competitiveness of the livestock and animal production sector. Again, as noted above, supportive legislation is available; however, revisions are likely to be required to take the emerging concerns into account. Considering that this study will address feed industry policies, details on existing legislation are described below.

²Githinji *et al.*, 2008: Feed sub-sector Survey Report. Ministry of Livestock Development and AKEFEMA.

3. POLICY AND REGULATORY FRAMEWORK OF THE FEED INDUSTRY

Below are definitions of key terms used in this report:

- A **policy** is as a "Statement of Intent" or a "Commitment", typically described as a principle or rule to guide decisions and achieve rational outcomes.
- **Regulation** is the promulgation, monitoring and enforcement of rules thus regulations are the implementation artefacts of **policy** statements.
- **Self-regulation** is a form of **self-polishing**, is the process whereby an organization is asked, or volunteers, to monitor its own adherence to legal, ethical, or safety standards, rather than have an outside, independent agency such as a governmental entity monitor and enforce those standards.
- **Regulatory framework** refers to a set of laws, regulations, guidelines, rules and codes that regulated entities are required to comply with and an institution or structure for enforcing compliance.
- **Hazard**: a biological, chemical or physical agent in, or condition of, food with the potential to cause an adverse health effect ⁽³⁾.
- **Waste**: substances or objects that fall out of the commercial cycle or out of the chain of utility and is not intended for re-use, recovery or recycling as animal feed.

3.1 Overview of the policy and regulatory framework

Table 2 summarizes the policy and regulatory framework for Kenya. Key legislations are: The Fertilizer and Animal Food stuff Act Cap 345 (1967), Standards Act Cap 496 and Animal Disease Control Act Cap 346. The enforcing agents are: Ministry of Livestock Development (Livestock Development and Veterinary Services Departments), Kenya Bureau of Standards (KEBS) and Kenya Plant Health Inspectorate Services (KEPHIS) phytosanitary regulations for importation of grains and other crop used in feed processing. Laboratory testing of feeds falls under the **Kenya Bureau of Standards**.

Some of Animal feeds standards include: KS CAC/RCP 54-2009 Kenya Standard - Code of Practice on Good Animal Feeding and KS 1647:2001 Kenya Standard - Code of practice for animal feed production, processing, storage and distribution. The key animal feed legislation, Cap 345, was addressed by the National Livestock Development Policy of 1980 and Session Papers of 1981 on Food Policy and 2008 on National Livestock Policy. Despite revisions, only animal feed products intended for sale are currently regulated by this Act, but animal feeds manufactured on-farm for own use are left out. The danger here lies in running parallel production systems that all supply the same consumer. Feed safety issues on feed premixes, medicated and additives are not mentioned in the documents. Benchmarking on the European Union feed industry, there are standards that can be adopted locally to address the feed safety issues. These standards are on additives for use in animal nutrition, including undesirable substances, a list of intended uses of animal feeding stuffs for specific nutritional purposes, and a regulation on authorized use of the feed and placement on the market.

³FAO (2010). Codex Alimentarius Practice on Good Animal Feeding.

Table 2. Summary of the main Kenyan animal feed policy and regulatory framework.

Legislations governing the industry	Enforcing agencies	Comment
Fertilizers and Animal foodstuff Act [Cap. 345],	Ministry of Livestock Development (Livestock Development and Veterinary Services Departments)	
Standards Act [Cap. 496]	Kenya Bureau of Standards	Some of Animal Feeds Standards include: <ul style="list-style-type: none"> • <u>KS CAC/RCP 54-2009</u> Kenya Standard - Code of Practice on Good Animal Feeding • <u>KS 1647:2001</u> Kenya Standard - Code of practice for animal feed production, processing, storage and distribution. KEBS is main for Laboratory testing of animal feeds
Animal Disease Control Act [Cap. 364],	Ministry of livestock Development (Livestock Development and Veterinary Services Departments)	
Seed and Plant Varieties Act (CAP 326)	Kenya Plant Health Inspectorate Service (KEPHIS)	Phytosanitary regulations for importation of grains and other crop used in feed processing
The Public Health Act (Cap 242);	Ministry of Health	
The Environmental Management and Coordination Act (Cap 8)	National Environment Management Authority NEMA	There is National Environment Council for policy direction

Given inadequacy of livestock extension services, in particular those on livestock feed and feeding, and low competence by feed manufacturers and livestock producers, it is possible that current feeds, particularly for ruminant feeds, could be substituting instead of supplementing rations. Substitution instead of supplementation of feeds is more expensive. Performance responses by large animals from feed additives could also indicate poor feed formulation and feeding strategies. Invariably, unjustified use of feed additives increases the cost of feed products.

Ruminants that are allowed to graze are less responsive to concentrate feeding compared to the non-ruminants (poultry and pigs). Perhaps it is as a result of this greater responsiveness in poultry, that poultry producers who formed Kenya Poultry Farmers Association (KEPOFA) have been able to guard against poor feed quality. Arguably, KEPOFA has been more active than AKEFEMA, perhaps because it sees the pivotal role of good feed quality in the poultry industry.

Under good manufacturing practices there are areas of concern to the industry which include risk management, risk communication and hazard analysis critical control points (HACCP). Modern feed industries have established the international Rapid Alert System for Food and Feed (RASFF). It provides food and feed control authorities with an effective tool to exchange information about measures taken in response to serious food or feed risks detected. This exchange of information helps member states to act more rapidly and in a coordinated manner in response to a health threat caused by food or feed. However, the current Kenya legislation framework does not address RASFF.

The advent of recent technologies including the introduction of genetically modified organisms and pesticides/chemicals require an understanding and fact-based decisions on whether to embrace, or disallow their use. In the absence of empirical approaches and the prevalence of weak regulatory frameworks, bans become rhetoric and less useful for their intended purposes. Kenya should institute a dynamic fact based policy making process by allocating competent talent and adequate time, sharing best practice in policy-making and providing more opportunity to network with stakeholders.

Currently, any person who contravenes a provision of the Act CAP 345 or the feed regulations is guilty of an offence and liable on summary conviction to a fine not exceeding KES 3,000 or 3 months imprisonment, which is now too low to be a deterrent. Understandably, sentences awarded by courts often have a limited deterrent effect. This makes it a challenge to enforce the Act. These charges were not revised or reviewed in both Session Papers of 1981 and 2008. Session papers are policies and cannot deal enforceable charges. Revision of charges requires amendment or revision of the CAP 345.

The Kenya National Livestock Policy (2008) and Kenya Urban and Peri-urban Agriculture Policy (2010) acknowledges that the current legislations have not kept pace with development in the sector; hence, a number of legislations are out of date and do not match with international standards of practice. The Kenyan feeds industry also suffers the same fate. For instance, when farmers reacted to poor feeds quality in the mid-1990s, the government (MoLD) responded by setting up a taskforce mandated to monitor quality of feeds and other agricultural inputs. However, the taskforce ended up being "inactive" due to lack of clear guidelines for carrying out their mandate. Also, after the government had appointed some people as feed inspectors, this rendered quite ineffective as this was overtaken by other new measures and new appointments.

The policy and regulatory framework governing the feeds industry is based on four pillars that have the profound role of ensuring feed safety, i.e. (i) the nature of the feed supply chain, (ii) standards and quality control mechanisms in the feed industry, (iii) livestock products and public health concerns, and (iv) the established regulatory framework in the industry.

3.2 Nature of feed supply chain

Feed supply and feed safety are inter-twined because source of feedstuff, storage, processing and handling can potentially affect the quality and safety of feeds ⁽⁴⁾. Trends along the feed supply chain affect the feed industry from three perspectives: (i) costs of raw materials which has affecting production costs and subsequent prices of finished feed products, (ii) availability of raw materials for feed millers and finished products for farmers, and (iii) quality of raw materials affecting the quality of finished products.

The Kenyan feed industry highly depends on by-products from other industries such as breweries and food processors (e.g. Posho Mills) and imports.

⁴Pinotti L. (2011). Feed safety in the feed supply chain, *BASE Journal 15(1)*, 9-14.

Different production lines yield by-products varying in quality, in turn affecting feed quality. In addition, importation of ingredients of unknown composition (including residual levels of toxic compounds) is risky to animal health and food safety. Currently, KEBS has no stipulated standards on raw materials. Regional harmonization of standards means regional set standards take precedence to national standards. Thus the country exporting raw material is responsible for ensuring quality standards. In the absence of standards this presents a glaring gap and leaves a lot of responsibility to exporting countries some of which have scarce laboratory facilities. There is need to address this loop hole in procurement of quality ingredients.

3.3 Standards and quality control

There are several standards put in place to regulate feed industry and livestock subsector in general. However, gaps exist; for example, currently there are no standards for use of by-products from industrial wastes in the processing of livestock feeds. Few feed millers use laboratory-determined ingredient chemical composition as a basis for procurement. This precludes consistent ration formulation and consequently results in variable feed product nutrient composition.

Feed standards setting is a commitment by the Government of Kenya to promote sustainable growth of the livestock sector and provide a safe food supply to the public. The standards have two perspectives, legal and institutional aspects. Legal aspects refer to legislations whereas institutional aspects refer to bodies charged with development of standards and legislation and with authority to implement/enforce the legislation.

3.4 Legal framework

The legal framework consists of legislation that empowers the relevant institutes to carry out their mandate. The main Acts of Parliament (see earlier list) that shape the feed industry in Kenya are the Fertilizers and Animal Foodstuff Act [Cap. 345], the Standards Act [Cap. 496], the Animal Disease Control Act [Cap. 364], Customs and Excise Act [Cap. 472], Public Health Act [Cap.242], Plant Protection Act [Cap. 324], Weight and Measures Act [Cap 513] and the Trade Descriptions Act [Cap. 505]. So far, the livestock sector seems to have had the leeway to develop its own institutions and legal framework.

Some important Acts are:

1. *The Fertilizers and Animal foodstuff Act [Cap. 345]* regulates the importation, manufacture and sale of agricultural fertilizers and animal foodstuffs and substances of animal origin intended for the manufacture of fertilizers and foodstuffs. Specifically, CAP 345 is an Act of Parliament to regulate the importation, manufacture and sale of agricultural fertilizers and animal foodstuffs and substances of animal origin intended for the manufacture of such fertilizers and foodstuffs, and to provide for matters incidental to and connected with the foregoing. It was first published in 1967 has been review twice by Session papers of 1983 and recently 2008. There is need to separate the Act from Fertilizers to remain Animal feedstuff only. Also there is need to review penalty fees to approximate today's living standards.
2. *Standards Act [Cap. 496]* empowers the Kenya Bureau of Standards to set and control standards or codes of practice for commodities produced or imported into Kenya. It aims to promote protection in three dimensions namely public health safety, environmental safety and economic safety. In reference to the feed manufacturing industry, the Act provides inspectors with power to inspect processing operations, specify both input and output of the production line, and issue the relevant standardization mark of quality. Current complains about feeds quality warrant an informed approach to reform KEBS weak feed regulatory framework.

3. *The Animal Disease Control Act [Cap. 364]* regulates animal disease control mechanisms. Under L.N.326/1996, the Animal Disease Control Act empowers government livestock officers and veterinary officers to inspect/prohibit importation meat and bone meal and their products. Kenya has few rendering plants, however existence of zoonotic diseases such as scrapie, BSE and avian influenza requires that a trace-and-tracking system, surveillance and monitoring framework is in place.
4. *Customs and Excise Act [Cap. 472]* provides rules of thumb for the management, assessment and administration of customs and duty. Kenya feed millers in part rely on international markets to meet their input requirements in feed manufacturing. Therefore, the amount of duty charged on raw materials for the feed manufacturing industry as well as the end products has implication on the consumer prices and the overall competitiveness of the industry. The AKEFEMA grain crisis paper of 2012 should be encouraged but future presentations need to be informed by impact data, brief and precise.
5. *Public Health Act, [Cap.242]⁽⁵⁾* is responsible for making provisions to ensure public health and food safety. There is need for better networking between this department, Ministry of Livestock and Development, Ministry of Industrialization to ensure that feed quality and safety mandates are assigned and not duplicated.
6. *Weight and Measures Act [Cap.513] ⁽⁶⁾* amends and consolidates the law relating to the use, manufacture and sale of weights and measures and to provide for the introduction of International System of Units (SI) and for connected purposes.
7. *Plant Protection Act [Cap.324]⁽⁷⁾* lays down guidelines for the prevention of the introduction and spread of disease destructive to plants. This include screening of the imported plants and plant materials or being moved from one country to another. The Act confers power to enforce the legislations to the Minister for Agriculture.
8. *Trade Descriptions Act [Cap. 505]* establishes a system of units of measurement, controls weighing and measuring equipment in use for trade, controls transactions in some goods, and protects the public against false trade descriptions. The Act advocates for compulsory verification of new and repaired weighing equipment as well as periodical checks.

3.5 Regulatory Institutions for the feed industry

The institutions that regulate the feeds industry in Kenya include the Ministry of Livestock Development (MoLD) through its two departments (Department of Livestock Production and Department of Veterinary Services), Kenya Bureau of Standards (KEBS), the National Environment Management Authority (NEMA), Kenya Plant Health Inspectorate Services (KEPHIS), Kenya Revenue Authority (KRA), and the National Bio-Safety Authority (NBA).

The functions of the Department of Livestock Production are largely in animal breeding, nutrition, husbandry and marketing. The Department of Veterinary Services is responsible for disease control, regulatory management and quality control of inputs, livestock, livestock products and by-products which include livestock feeds.

⁵http://www.kenyalaw.org/kenyalaw/klr_app/frames.php

⁶http://www.kenyalaw.org/kenyalaw/klr_app/frames.php

⁷http://www.kephis.org/images/stories/pdf_files/legal_notice.pdf

The KEBS is responsible for setting standard codes of practice. With regard to the feeds industry, KEBS is mandated to monitor the quality of feedstuff by conducting regular spot checks.

The KRA is responsible for collecting and enforcing revenue laws. The relevant revenue law that hinders or promotes the feeds industry in Kenya is that which prescribes customs and excise duty. In the fiscal year 2010/11, the government of Kenya zero-rated import duty on all feedstuff raw materials in an effort to increase competitiveness of the Kenyan feed industry.

The NEMA ensures that the feed industry complies with environment codes of conduct when carrying out their operations. This relates to use of inputs and disposal of wastes/by-products in the feeds industry. The NBA is a new agency in Kenya established to regulate the handling and use of Genetically Modified Organisms (GMO) products. Over-reliance on imported feeds ingredients in Kenya necessitates the central regulatory role of the NBA in the feed industry. However, the capacity of NBA to screen for GMO materials in the feeds ingredients, especially those imported in processed form is questionable. Furthermore, there is no sufficient mechanism for enforcement of the GMO Bill. As aforementioned, all these departments need to cooperate to optimally support modernisation of the policy-making process.

3.6 Institutional roles and assignments

There is need for efficient and adequate operational level co-ordination amongst relevant MoLD departments and personnel. This is lacking. For example, the Departments of Livestock Production and Veterinary Services often conflict in supervision and enforcement of feed industry regulations. In general, manpower is inadequate and competency lacking to enforce the regulations (NLP, 2008).

The AKEFEMA was established to self-regulate feed millers but registered members are not monitored to ensure compliance with registration requirements (e.g., the 5 Star AKEFEMA rating).

The KEBS remains the secretariat for feed standards and has introduced the Diamond and S-marks of quality (see Appendix 2). However, it does not yet has the capacity to enforce these quality marks. The MoLD Session Paper of 2008 discusses the formation of an animal health inspectorate service to license, regulate and enforce feed standards but this has not yet been realized. The paper does not discuss operationalization of the animal health inspectorate service and has no budget and implementation plan for it. Currently, there are no monitoring programs or assessment/evaluation programs for on-going feeding practices and the implications of the practices on the Kenya feed industry and livestock production competitiveness. In the absence of information, reliable industry data and information, it is difficult for the state to assure the public that agricultural products used in the country are of good quality and do not pose any risk to animals, humans and the environment.

3.7 Overview of policy recommendations from previous reports

The role of the Government in the feeds industry is primarily monitoring and regulatory to ensure feed standards and requirements are adhered to in the value chain as well as providing necessary policy and institutional support. However, several issues of concern still affect the development of the feeds industry. These include: high cost of inputs, fluctuations in quality and quantity of feedstuff, increase in number of feed processors with inadequate technical and market information, increased competition among processors despite unstable market environment and incapacity of the government institutions such as KEBS to perform supportive and monitoring roles.

Recommendations by stakeholders for policy change in the livestock sector include (i) institutional recommendations (aiming at strengthening the relevant institutions) and (ii), legislative recommendations (aiming at improving legal rules).

3.7.1 Institutional recommendations

- Formation of new forms of institutional arrangement that would reduce transaction costs and fill the vacuum left when governments withdrew from markets in the era of reforms and structural adjustments.
- Restructuring and/or strengthening of the existing institutions such as AKEFEMA and broaden their mandate. The institutions should lobby for strengthening and/or enactment of legislation to protect farmers and consumers against substandard feeds and animal products, respectively.
- Focus on capacity building of farmers, feed manufacturers, regulating agencies' staff on better practice in the feeds industry.
- Transfer of regulatory roles to the most appropriate departments/organs/ministries to control problem of conflicting legal mandates.

3.7.2 Legislative-based recommendations

- Revision of the policies incongruent with national goals and subsequent standards for feeds in a collaborative manner to ensure participation of all applicable stakeholders in the industry.
- Harmonization of conflicting legislations to increase efficiency among government agencies that regulate the feeds industry.
- Setting of new/secondary standardization yardsticks/marks of quality tailored for feed manufacturers besides KEBS's as additional check of quality in the feed manufacturing industry.
- Advocacy for alternative mechanisms of regulating the feeds industry. Regulatory systems available include self-regulation, market leader innovator and third-party certification.

4. PUBLIC HEALTH CONCERNS

To meet expected performance standards, and to protect human and animal health, feedstuffs should be of a consistent quality. Policy focus should be to prevent risks to animals and subsequently ensure safety to humans consuming the livestock products. The next section discusses feed safety issues and the current situation in Kenya.

4.1 Food and human health concerns

There is correlation between animal health and human food safety; hence, ensuring the safety of livestock feed to animals has been a major focus in livestock production. Health concerns have led to the development of codes of conduct or regulations by international organizations such as the Food Agriculture Organization (FAO) and the World Health Organization (WHO) for the prevention and minimization of health risks associated with contaminants. Despite some agents causing harm to human health directly, some are transmitted from the affected animals (through feed), including *Mycobacterium bovis* (cattle tuberculosis), *Salmonella* sp., BSE agents, heavy metals, mycotoxins (i.e. toxins produced by fungi) and dioxins.

In Kenya, human health/food safety and animal welfare issues are regulated by the Public Health Act [Cap.242] and the Animal Disease Control Act [Cap. 364] which are implemented by the Public Health and Environmental Health and Sanitation departments (under the Ministry of Health and Sanitation) and the Department of Veterinary Services (under the Ministry of Agriculture), respectively. The informal food/feed sector, accounting for 80% of the supply to the domestic sector, is to blame for the prevalence of food-borne diseases in Kenya (Oloo, 2010).

One of the greatest challenges comes from feeds of animal origin including meat, bones, carcasses and blood meals. Contaminants arising from inclusion of such ingredients in rations are known to have different effects and pose specific risks to animal health (e.g., BSE, scrapie, & *Salmonella*) and subsequently human health.

Food hazards associated with animal feeds can be categorized either as biological hazards (e.g. certain fungi, bacteria and viruses), physical hazards (e.g. foreign objects such as wooden and plastic objects) and chemical hazards (e.g. industrial chemicals and mycotoxins) (IOE, 2011). In most cases, feed contamination is associated with biological and chemical hazards. The most dangerous feed contaminants are discussed in the following sections.

4.1.1 Bacteria and viruses

Salmonellosis, caused by *Salmonella enteritidis*, is mainly, but not exclusively, associated with poultry products. Pathogenic strains of *E. coli* can be transmitted through animal products from contaminated plants. Manure infested with pathogenic *E. coli* that is applied to agricultural land can contaminate crops. Newcastle Disease Virus (NDV) outbreaks often result in huge poultry losses. BSE (Bovine Spongiform Encephalitis) caused a very large outbreak mainly in Europe, and led worldwide to legal restrictions on using meat and bone meal as animal feed. Use of animal products as feed in Kenya is primarily governed by the Fertilizers and Animal foodstuff Act [Cap. 345]. However, there is lack of enforcement of the Act due to lack of necessary policies to control feed manufacturing and preclude use of bone meal products.

4.1.2 Mycotoxins

Mycotoxins are substances excreted by certain fungi, especially *Fusarium* species infecting harvest products like grains (and potentially many other products). Storage conditions determine whether these fungi can continue to grow during storage. Mycotoxins are passed into animals through contaminated feed. Feeds most susceptible to aflatoxins, a mycotoxin, include cereals (especially maize), cottonseed, peanut, copra, palm kernel and rice bran. Primarily, mycotoxins are transmitted into feeds when contaminated ingredients are used to manufacture feeds. The mycotoxins that are considered to be important are aflatoxin, deoxinivalenol, zearalenone, ochratoxin and fumonisin. The negative effects of these fungal metabolites include unthriftiness, reduced performance (e.g. poor growth, reproduction and egg production), immuno-suppression leading to susceptibility to infectious diseases and high mortality. Strategies for monitoring and effective control, detection, quantification and dynamic surveillance of mycotoxins are therefore required. With this in mind, it is important to note that the existing policy framework does not fully address this issue. Also, within the framework technical instructions on feed ingredients and feed products sampling to ensure realistic information and data is important and therefore should be part of the regulatory framework.

Testing feeds for mycotoxins requires a modern laboratory, making it difficult to be carried out on a regular basis due to financial limitations. Contamination risk is greater if there is no traceability/monitoring systems in place for raw materials being used in feed processing. Overdependence on feed ingredients which cannot be traced from the source through processing to the farm-gate aggravates efforts for quality control in the feed industry.

Human health is at stake if toxins are present in consumed products. This is especially the case with aflatoxin, for which animals are symptomless carriers, but which accumulates in livestock products (eggs, meat and milk). As a result, farmers may take issues of aflatoxin contamination not seriously. As a result, extension services for good feeding practices need to be integrated in livestock development programs. Furthermore, inquiry into the fundamental interaction between different mycotoxins with other environmental and nutritional factors will facilitate validation of guidelines on tolerable levels in the feed value chain.

4.1.3 Heavy metals and agro-chemicals

Heavy metal compounds include lead, mercury, cadmium and arsenic. These chemicals may pass into the feed chain when forages and other feed ingredients are grown in environments containing such compounds; for example, near mines or contamination of clean ingredients during procurement and handling/transportation across such environments. The hazard of heavy metals is the bio-accumulation of these metals along the food chain.

Agro-chemical residues resulting from application of pesticides and fungicides in agricultural production of feed ingredients such as cotton, maize and sunflower can also result in contamination of finished feed products if proper application procedures are not observed. Current feed analysis laboratories in Kenya do not have facilities to determine heavy metals.

4.1.4 Genetically modified organisms (GMOs)

GMOs have artificially altered genes to change their characteristics purportedly to benefit plants and animals. The increase in controversies surrounding the GM technology has caused fear among consumers; hence, adversely affecting their perception of bio-technology. For instance, use of GM products is not allowed in the EU. Since the Kenyan feed industry is quite dependent on external supply, ban of GM products in developed economies evoke doubts on the capacity of developing countries like Kenya to cope with potential hazards associated with use of GM products in feeds.

Legislation and regulations in place for guiding use of GM products and bio-technology do not adequately address needs of the feed industry despite its over-dependence on imports of feed and feed ingredients. The scientific tests that are required to prove that a feed product contains GMOs are also expensive and require skill in interpretation. If Kenya is to protect itself against GMO products, then policy should favour support to national scientific institutes including KARI, and Universities to train and equip their laboratories to conduct such analysis. However, KEPHIS laboratory has the capacity to carry out GMO tests.

4.1.5 Danger of dioxins, denatured oils and pesticides

Dioxins result from incineration and waste burning of chlorine-based chemical compounds with hydrocarbons, polyvinyl chloride (PVC) plastics. The most toxic dioxin is 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD). The PCBs that act like dioxins are measured in relation to TCDD activity. If livestock ingest feed contaminated with dioxins, these substances accumulate in the body of the animal and can be passed on to humans as food, who then are at increased risk of developing cancer. In addition, exposure to dioxin can also cause reproductive and developmental problems. Equally, denatured oils such as feed industry vegetable oils and vegetable oil residues and by-products often incorporated to increase feed energy levels also present a risk to animals as they introduce carcinogenic compounds in the feed and food supply chain. Raw material by-products from plants which have been treated with chemical pesticides sometimes contain residue levels which are above permissible limits. The policy and regulatory framework should therefore be cognizant of the possible contamination of imported ingredients.

4.1.6 Advent of novel feed and antibiotic products use

The advent of novel feed ingredients and products is now reality and sub-therapeutic feeding of antibiotics is a well-established practice in farming. Usage of antibiotics to cleanse the gut is known to increase growth and improve feed conversion efficiency but concerns remain around the extent of their use. Feed input suppliers have introduced several products including growth promoters (e.g., in beef, poultry and swine feeds), yeast, toxin binders, industrial waste and other inorganic supplements, chelated minerals, herbs and direct fed micro-organisms. At times, though not empirically proven in Kenya, the economic benefits of using these products can be substantial. Their introduction remains a dynamic process that requires competent communication to the users on potential benefits and risks. Policy on feed production related good manufacturing practices and effective extension support systems is imperative. There is real fear that indiscriminate use of these products results in environmental pollution of water and consumption of residual substances such as growth promoters can also affect human health as evidenced by use of a common growth promoter, diethylstilbestrol, on early attainment of puberty in young girls in South America. Kenyan policy and regulation should therefore be proactive on the availability and use of these substances and build empirical data on their efficacy without relying on product market promotion information.

4.2 Food safety related studies in Kenya

Feed and food contamination in Kenya is nothing new. There has been several food poisoning related fatalities reported in Kenya since 2000. About 100 deaths were reported in 2004 and over 70 and 50 deaths were reported in 2005 and 2011, respectively, from aflatoxin food poisoning. This indicates that there is vulnerability to contamination along the food chain. Few literature on feed/food mycotoxins exists in Kenya; however, a few studies are reviewed below.

Kang'ethe *et al.* (2007) reported that 72% of milk sampled was contaminated with aflatoxin M1 with the highest level of 1.56 micrograms/kg recorded in Machakos. This is beyond the maximum limit allowed (0.5 micrograms/kg). Findings from the feeds analysis also recorded high level of Aflatoxin B1 of up to 1.12 micrograms/kg in Eldoret.

Okoth and Kola (2012) analysed food and feed samples obtained from shops within Nairobi for aflatoxin. Maize samples were used in the analysis since it is the major feed and food component. 83% had aflatoxin B1 above the World Health Organization (WHO) limit (10 pbb), and even 95% of sampled feeds were contaminated making them unfit for consumption. This is a clear indication of use of poorly stored and contaminated raw materials in feed manufacturing. Underperformance of the Kenya Bureau of Standards could be related to the high cost of screening tests.

As indicated earlier, the feed industry in Kenya relies heavily on imported ingredients whose nutritional value and contamination levels are not known. In addition, standardization of some ingredients and feed products has not been established by the relevant quality control body, thereby putting the health of livestock and consumers at risk. Post-harvest handling during storage and transportation of these commodities may expose them to conditions which may promote contamination.

Makun et al. (2010) suggested that in order to protect consumers from food safety hazards, legislation on the maximum tolerable limits of mycotoxins and chemical residues in the feed and food that enters into the food chain should be set in-line with internationally recognized standards. The greatest challenge towards legislation in Kenya and other nations in Sub-Saharan Africa is the standardization of ingredients and feed products. Even where quality control agencies exist, some of them are dysfunctional. Existence of informal feed and ingredients markets exacerbates the problem of lack of capacity by the regulatory agencies.

There are clear fluctuations in aflatoxin contamination in Kenyan feed (Fig. 1). This is due to fluctuation of feed resources in the country and varying quality of ingredients from different sources. Dairy cattle feed contained the highest level of aflatoxin. Recently, KEBS (personal communication) reported of an incident where pig feed manufactured in Nakuru was sold to a pig farmer in Nairobi. The fed pigs died and the farmer brought samples to KEBS for analysis. KEBS determined that the submitted feed sample had aflatoxin levels higher than stipulated for pig feed. The case is now under trial and KEBS will be a witness.

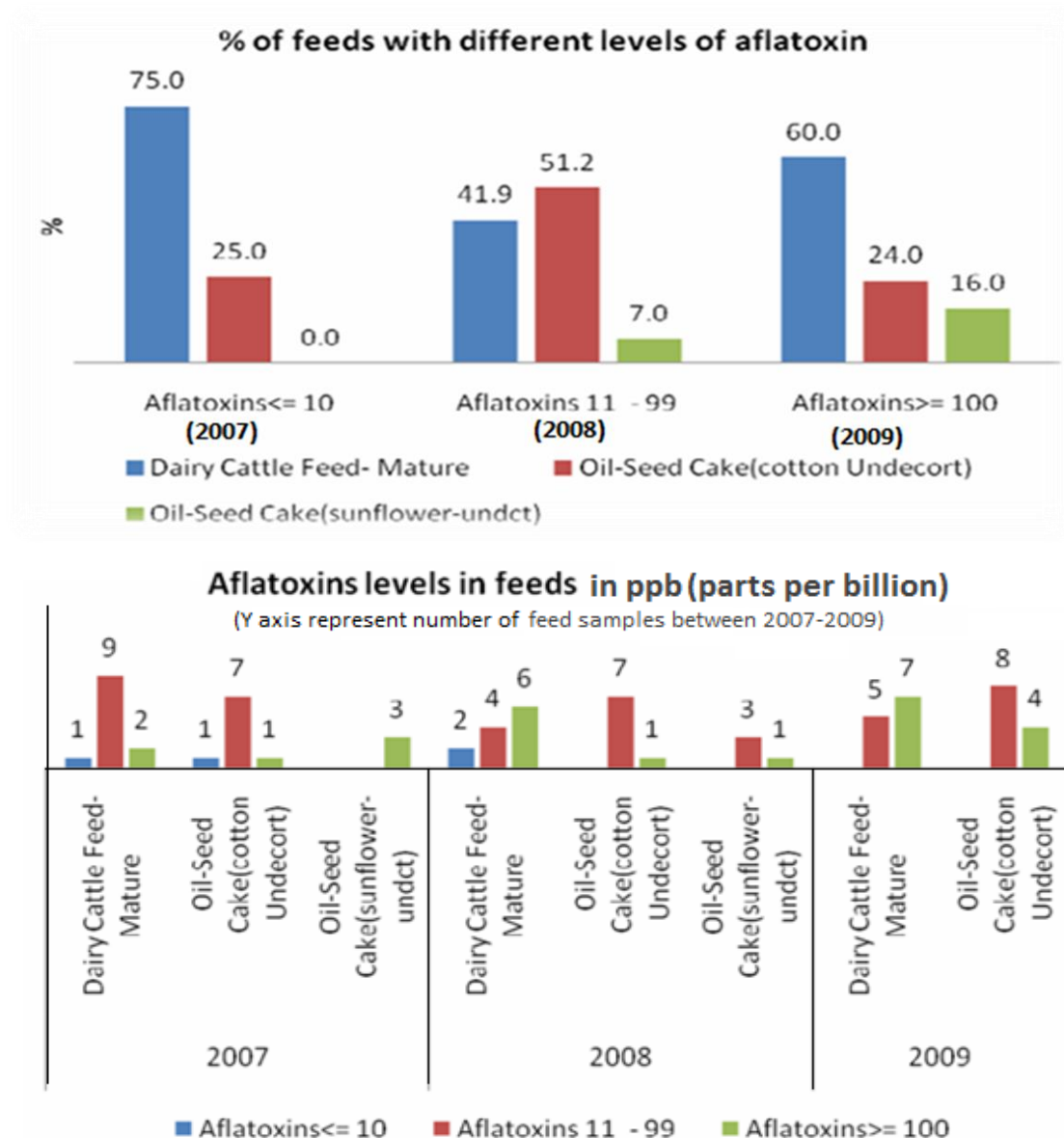


Figure 1. Aflatoxin levels (ppb) in different feed types in Kenyan feeds between years 2007 – 2009 (Source: Okoth and Kola, 2012).

4.3 Recommendations

Numerous reports have reiterated that there is public perception that commercial feeds are of poor quality. Fraud and product remixing/packageging is acknowledged to be common. Farmers’ perception is that the best feed is made by new feed milling entrants and a few months later quality drops to approximate competitor products. Whilst this might be true, it could also be an indication that low entry barriers in the industry eventually makes new entrants fail to maintain quality costs as the market is a low cost winner market. To gain consumer confidence it is important that the government works with the industry to raise confidence and assures the public of animal feed quality and safety.

4.3.1 Imports of feed ingredients and feed products

Failure of imported animal feeds to conform to standards for importation of feed ingredients and products of animal or plant origin poses risks to the Agricultural industry and the food chain. The Plant Protection Act [Cap.324] and the Animal Disease Control Act [Cap. 364] protect against risks to crops and animals, respectively. There is need to revise and ensure that licenses and permits in this regard are harmonized with a view to clarify grey areas, reduce jurisdiction confusion amongst enforcers and ultimately strengthen enforcement of the regulations. Updating these and ensuring that they are integral to feed industry regulations is important to protect against unregistered products entering the industry and food chain contamination.

The Act should clearly state procedures to be taken with respect to imports including feed ingredients and other agricultural production inputs. This is of importance to Kenya where ingredients are largely imported and more so under emergency and mitigation cases such as drought or unfavourable weather conditions (e.g. which favour mycotoxin accumulation). Whatever the case may be, the provision should allow for prudent and rapid decision processes to address the emergency while addressing bio-security and preventing negative legal implications. To achieve this requires experienced expertise that in turn requires attractive employment packages.

4.3.2 Disclosing animal feed nutrient contents and labelling for traceability

There is need to address issues of food safety, animal welfare and end users choice. Few feed millers disclose nutrient contents of their animal feed products although the CAP 345 stipulates so. There is only a weak regulatory framework to enforce regulations on labelling of animal feeds in order to offer users product choice. Labelling requirements must not be limited to minimum mandatory standards but should encourage feed manufacturers to divulge more information on their labels.

4.3.3 Sampling and testing protocols and laboratory facilities

There is a lack of sampling/testing protocols for animal feeds and raw materials as well as laboratory facilities to carry out the analyses. To assure and monitor the quality of animal feeds and raw materials in Kenya, it is essential that accredited laboratories are available with experience in analysing animal feedstuffs.

5. KENYA FEED INDUSTRY COMPETITIVENESS

5.1 Cost of raw materials

There has been an upward trend in the cost of ingredients used in feed manufacturing. This trend is a result of increase in demand for the ingredients, and competition between animal and human food requirements, and other industrial needs such as bio-fuel production in the world market. Locally, the feed industry in Kenya largely relies on imported feed ingredients such as maize, maize germ/bran, wheat bran and pollard, soybean and its derivatives, sunflower cake, nut cakes, cotton seed cake, fish meal, and micro-ingredients (usually additives) from the EAC, SADC regional market and other international markets. A slight change in trade policies in the source countries has a potential negative impact on availability and the cost of animal feed in the country. The effort by the government of relieving feed manufacturers of production costs by zero-rating imported feed ingredients has not yielded any price reduction for farmers. This move can also have an adverse effect on self-sufficiency by undermining the national capacity to produce its own need for feed ingredients. AKEFEMA (2012) presented to Livestock and Finance Ministers and their respective Permanent Secretaries a “Grain Crisis Paper”. The paper is a clear indicator that existing grain importation policy only considers human requirements and completely ignores livestock needs. While the paper was informative, it only considered immediate sector needs and not long term solutions such as to stimulate crop farmers and invest in large-scale contract farming projects. Yet at short and medium term, the feed manufacturing industry needs to be facilitated and stimulated by the government, through conducive fiscal policies and other incentives, to import quality raw materials like soy, yellow maize and other energy and protein rich feed ingredients, purposely grown for animal feed and which are GMP/HACCP certified.

Parallel to this, domestic raw material feed supply chains can be developed. The livestock sector development policies have for a long time failed to provide incentives to producers/farmers to diversify and increase production of necessary inputs. This would stimulate competitiveness to the feed industry. The essential incentives include asset financing for specialized equipment required to produce and process feed ingredients, provide extension knowledge to farmers with more emphasis laid on the target feed crops (such as sunflower, cotton and yellow maize), and enhancing raw materials producers’ market access to protect them from exploitation and other adverse shocks. Yellow maize is uncommon in Kenya and presents a good alternative as it does not compete with national white maize requirements. In addition it is crucial to look into the registration process of high yielding seed varieties for feed and fodder crops. Kenya is seriously lagging behind to other livestock and dairy economies when it comes to the domestic production of high quality and high nutritious feed and fodder crops.

5.2 Availability of raw materials and end products

Availability of raw materials for feed manufacture has a direct impact on the cost of the final feed products. Over-dependence on rain-fed agriculture exacerbates susceptibility of the agricultural sector to climate change thereby causing instability in the supply chain whenever there is inadequate rainfall. One remedy that has been advocated for a long time is investment in irrigation. While favourable policies in this regard exist, funding of irrigation infrastructure development has been inadequate and, where attempts have been made, mismanagement of funds by those responsible has contributed to failure. Availability of feed ingredients is likely to decline due to decreasing land holdings in the smallholder agriculture sector. There is no legislation to discourage uneconomic family subdivisions. Smallholder farms lack economies of scale which may result in high production costs per unit product. It is therefore necessary for smallholder producers to collectively trade and seek contracts or off-take agreements with feed processors. This would promote sustainable production.

Feed industry reports of 1998 indicate that major millers and distribution centres are located in Nairobi and Thika, making rural access to commercial feed a constraint. Feed supplementation, especially for dairy cattle, remains low and is estimated at less than 3 kg per cow per day. This could be an indication of limited access and high costs, making commercial feed unaffordable hence limiting concentrates use and dairy cattle productivity.

As part of the livestock development program, policy should favour legislation that encourages feed manufacturing industry into villages through incentives that promotes decentralization of feed mills from city areas to rural economies. This will hopefully improve access to quality feeds and increased efficiency of livestock production

5.3 Porters Competitiveness Diamond

The Kenya feed ingredient supply chain constraints should be addressed to provide lasting solutions that guarantee feed wholesomeness and quality that in turn guarantees animal production efficiency and public health safety (Figure 2). The detailed information presented in Figure 2 is necessary to inform reform of the feed policy framework to address systemic industry constraints. The Figure illustrates the feeds value chain and its related meta-institute challenges. Furthermore it details the enabling environment, support services factors and their inherent constraints. These issues are further addressed in the Porters Competitiveness Diamond of the feed industry in Kenya (Figure 3). Figure 3 illustrates a Porters model that is part of strategic analysis required to inform Kenya animal feed industry strategic planning and policy framework required to achieve both national and regional competitiveness.

The Factor issues (Figure 3) demonstrate disadvantages that requires innovation to overcome the problems including low productivity of quality feed products, poor land use, constraining the raw material supply chain and low labour efficiency characterized by low participation of women and youth. The Demand factor determines how the feed industry perceives and responds to farmer needs and it also creates the pressure to innovate. With low awareness of the existence of the S-Mark and unclear farmer complaint channels, Kenya currently has a compliant feed products market which is a disadvantage because it does not force the industry to become innovative and institute good manufacturing practices that guarantee feed quality. The Related Supply Industries factor is viewed from an understanding that the success of the industry is dependent on its suppliers of raw materials, the feed ingredients. In Kenya, the raw material supply chain is poor and over 75% of feed ingredients are imported. These are some of the causes of inconsistent feed quality and there remains a high risk of supply chain breaks when exporting countries change trade polices e.g. Tanzania ban on grain exports. Firm strategy, structure and rivalry factor indicates that poor feed industry organization, weak regulatory framework and lack of industry association (AKEFEMA) self-regulation, fragmented big and small companies with poor organizational goals and weak financial management makes the industry remain uncompetitive.

5.3.1 Detailed analysis – Feed Industry Porter’s Five Forces

Porter five forces analysis is a framework for industry analysis and business strategy development. Michael Porter developed this tool as an improvement to the “imprecise” SWOT analysis. The forces emphasize industrial organization (IO) economics to derive five forces that determine the competitive intensity and therefore attractiveness of a market. Attractiveness in this context refers to the overall industry profitability.

An "unattractive" industry is one in which the combination of these five forces acts to drive down overall profitability. Three of the factors describe external completion while two are internal threats. The feed industry’s Porters Five Forces are given here to inform about reform of the feed policy. A clear understanding of the prevailing industry situation for strategic policy formulation is crucial and brings industry relevance to the core of the policy formulation exercise.

5.3.2 Threats of new competition (both local and foreign)

- Local competition threats are high due to low entry barriers. Feed products on the market lack differentiation, low technology base thus low barriers to entry and no expenditure to be incurred when disrupting existing customer loyalties.
- Small feed millers are disadvantaged by undercapitalization and often cannot establish a defence mechanism against large competitors. This constrains establishing operations with requisite economies of scale, product quality and competitive pricing. Independent of economies of scale, cost advantages are not easily realized as industry and technical experience is low, equipment design is poor, borrowing costs are high and location and growth expansion models are unfavourable as most manufacturers of dairy products are located around Nairobi and Thika.
- Threat of foreign competition is possible where by some local companies can warehouse import feed products but transport costs and product integrity, especially aflatoxin contamination will also demand more costly packaging material. However, currently there is no regulation regarding mycotoxin risk handling or testing. Furthermore, feed product warehousing is currently constrained by high importation costs and few vacant go-downs that drive rental costs high.
- Kenya does not allow any genetically modified organisms or their derivatives. The ban appears to be temporary and was imposed as a safety measure by the Cabinet due to some information from France and a review mechanism is in place. The key point to note is that it appears there was no technical advice on this. Without fact-based approach to policy reform and regulatory measures the feed industry can be negatively impacted. In addition, without this GMO advantage there is reduced competitive advantage compared to South Africa and other developed countries.

5.3.3 Threats of substitutes or new products

Livestock feeds do not have much threat of new products except if the current quality issues are not addressed there might be increased feed product imports and warehousing; in actual fact feed products should be formulated for maximum genetic performance augmented by good manufacturing practices that guarantee good quality. Production efficiency is then bolstered by good extension. Talent and competence base, feed functionality in relation to maximizing growth and performance efficiency will determine the rate of entry and sustained product marketing by competitors. Given that in Kenya currently imports over 70% of its feed ingredients, the risk of imports is high and real. If the industry does not correct its feed quality weaknesses we might see entry of foreign companies who appoint distributors for warehousing concentrate of complete feeds.

5.3.4 Bargaining power of suppliers and buyers

Suppliers: Variability of climate (e.g. US drought reducing soybean yield), increasing biofuels demand and legislation prohibiting use of GMO ingredients seriously constrain the feed raw material supply chain. Consequently, this lowers Kenyan feed millers bargaining power but increasing that of other suppliers such as India, Uganda and Tanzania. To mitigate this, AKEFEMA should build members capacity to strengthen distribution channels and widen procurement of raw material, for example use of orphan (i.e., local) crops such as sorghum to substitute maize. Raw material procurement front line to reduce supplier ability to forward integrate should be strongly established.

Local solutions where the feed millers engage in contract farming of ingredients should be encouraged and under these agreements buyer presence is critical to monitoring production and raw material procurement.

Buyers: Feed products should be differentiated and packaged according to the demand situation. In addition, the products and services should be distinguished through extension service that specifically increases efficiency of client product use and increase profitability from quality feed products. Through market information and intelligence, the AKEFEMA should carefully analyse its product price and production costs to avoid losses and remain fact based on client bargaining power reduction. However, since the industry imports 70% of raw material and most companies are sourcing from same sources, it is difficult to differentiate products by price.

5.3.5 Threat of new competitors

If the feed industry does not self-regulate effectively to correct itself, crowding-in will be experienced as new players can enter the sector, including regional and international feed and ingredient supply companies. In order to crowd out new competitors, the feed industry will need high entry barriers and, in addition, shifting of production from simple feed mill ingredient mixing and lack of quality control to monitoring of animal performance against traditional formulated rations. Market information collected and analysed at the AKEFEMA Secretariat will require dynamic translation to market intelligence to inform management of imminent threats and mitigation. Weak enforcement of KEBS manufacturers S-Mark licensing increases risk of underground feed manufacturing competitors.

5.3.6 Intensity of competitive rivalry

In the Kenya feed industry, competitive rivalry is real because the feed industry has low entry barriers that allow entry of mediocre manufacturers with little equipment investment and can remain competitive. Within the livestock industry, the target animal remains the arbiter. Successful feed manufacturers/suppliers require nutrition knowledge supported by scientific data from laboratories that determine real time product chemical composition and quality control that meets target animal requirements. The industry should price feed products diligently, particularly avoiding low prices and profits that arises when competing companies vie for the same customers. Given that the raw materials are largely imported and similar, it will be difficult to make different feed products that distinguish each feed miller's brand. In the absence of a strong regulatory framework, counterfeiting and repackaging will remain a strong threat under rivalry.

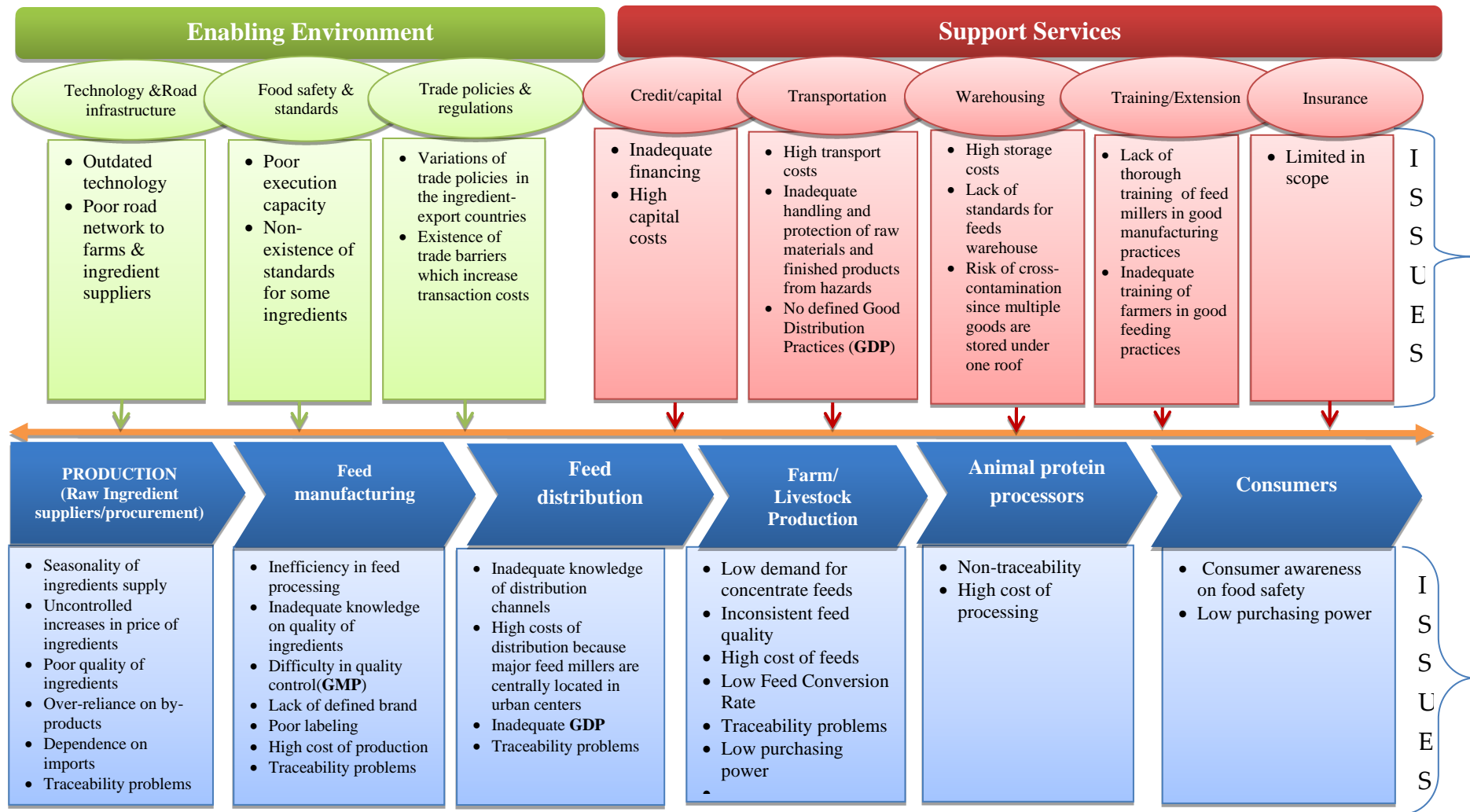


Figure 2. Feeds supply/value chain issues.

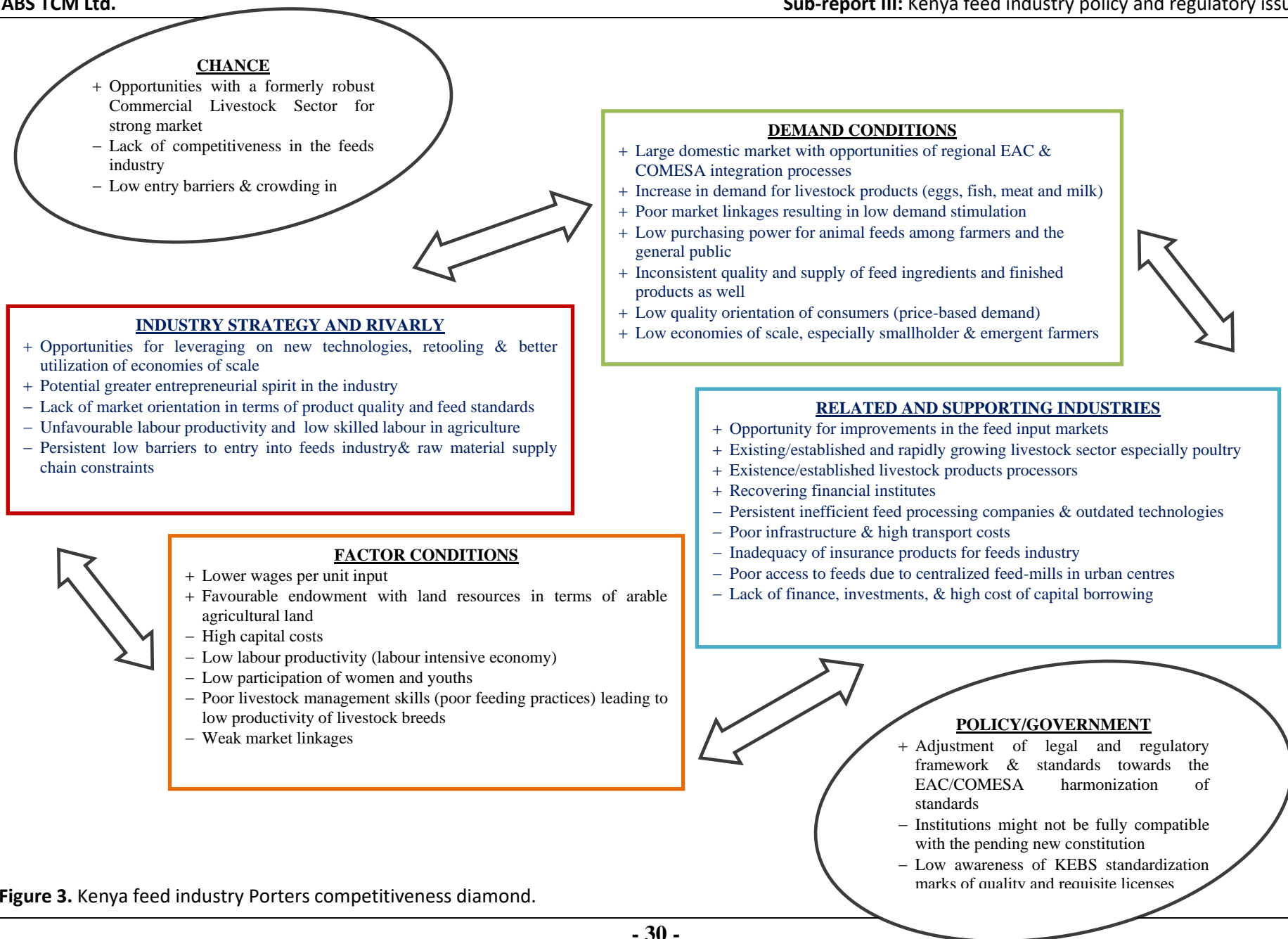


Figure 3. Kenya feed industry Porter's competitiveness diamond.

5.4 Benchmarking minimum standards and government systems in place

Kenya feeds industry can be benchmarked against several SADC countries such as Zambia, Zimbabwe, Malawi and Botswana (but not South Africa which has the most established feeds industry in Sub-Saharan Africa). These countries have more or less some common attributes such as dependence on rain-fed agriculture/pasture, dependence on agriculture by majority of population and established livestock subsector. Malawi, Zambia and Kenya have a large pool of smallholder farmers with limited land resource. Therefore, the governments have shown some effort in supporting the livestock sector in all the countries due to its relevance to their economies.

There is commonality in terms of policy put in place to regulate the feeds industry. In all SADC countries, the legal framework mainly focuses on production and use of feeds with emphasis on quality assurance. However, minimal attention has been paid to identifying and monitoring of critical points (where quality of feeds can be compromised) by creating guidelines for traceability purposes. Kenya has weak consumer organizations and the farmer organizations still lack capacity to effectively lobby for quality feeds. This partially explains why Kenya feed quality assurance (QA) programs are dysfunctional. While Kenya should consider rectifying feed quality challenges, it should be noted that the international QA program is about 15 years old and was largely re-active and a result of food scare triggers of which the major ones include:

- Salmonella in eggs and poultry meat (1988)
- High aflatoxin levels detected in USA maize gluten feed (1989)
- Residue antibiotics in eggs (1988 – 1992)

Triggers for drastic changes – required pro-active approach:

- BSE and meat-and-bone meal (1989, 1997, 2000)
- Dioxin in Brazilian citrus pulp (1998)
- Dioxin in Belgian feed fat (1999)
- Dioxin in German bakery products (2003)
- Aflatoxins in German animal feed originating from contaminated grain imports from Eastern Europe (2012/2013)

As a result of food scare triggers the improvement in global QA system was a shift from re-active to pro-active system. Actions taken include involving risk analysis in entire feed production chain by integrating Hazardous Analysis Critical Control Plan (HACCP) into Good Manufacturing Practice (GMP) standard. HACCP has also been applied in EU food industry linking the feed chain to food chain. The measures included upstream extension of quality assurance and downstream to all suppliers and transporters of feed ingredients. Also, development of an early warning system coupled to a good communication system where incidental unacceptable contamination despite all precautionary and controlled measures is reported.

Good Manufacturing Practice Legislation Botswana Case

Botswana does not have GMP legislations. However, as is the case with Namibia, given that the economy relies partially on exports of beef and beef products, the livestock sector is well-controlled to ensure that facilities meet stringent EU requirements.

An example of how seriously the Botswana authorities take this commitment is the self-imposed beef export ban introduced early 2011. The Botswana authorities decided to take 6 months to fully address deficiencies identified by EU veterinary inspectors from the European Commission Food and Veterinary Office who conducted an inspection mission to Botswana January 2011. Deficiencies that needed to be addressed included official controls, traceability, food business operator's controls and certification procedures. (AECOM International Development 2011)

Table 3. Summary of policy and regulations in selected sub Saharan countries (Source: AECOM International Development 2011).

ZAMBIA	
Legislations governing the industry	<p>Controlled by the Animal Health Act, 2010 (No. 27 of 2010) that:</p> <ol style="list-style-type: none"> 1. Defines powers and functions of veterinary officers (<i>e.g. Minister may make regulations on the manner of branding, labelling, marking or sealing packages or containers of any animal feed</i>) 2. Guides prevention and control of animal diseases, 3. Regulates the import and export of animals, animal products, animal by-products, articles and animal feed, and 4. Establishes the Animal Disease Control Fund. <p>Agriculture (Farm Feed) Regulations (Cap. 226).</p> <ol style="list-style-type: none"> 1. Contains registration of animal feeds, analysis and laboratory controls, sale of feeds and restricted and prohibited inputs. <p>NB: Guidelines are generalized for all feeds products.</p>
Enforcing agencies	<ol style="list-style-type: none"> 1. Department of Veterinary & Livestock Development- responsible for registration of local animal feed producers and for certification of factories however it does not have feed testing facility
Laboratory testing	<ol style="list-style-type: none"> 1. Food and Drug Directorate 2. University of Zambia 3. Zambia Bureau of Standards (ZABS).
Good Manufacturing Practice (GMP)	<ol style="list-style-type: none"> 1. ZABS has certification scheme for quality conformance.
MALAWI	
Legislations governing the industry	<ol style="list-style-type: none"> 1. Regulated by the Fertilizers, Farm Feeds and Remedies (Farm Feeds) Regulations (G.N. No. 159 of 1973)
Enforcing agencies	<ol style="list-style-type: none"> 1. Department of Animal Health and Livestock Development (DAHLD) with the assistance of the Malawi Bureau of Standards (MBS). 2. DAHLD is responsible for the registration and certification of manufacturing facilities.
Laboratory testing	<p>Malawi Bureau of Standards (MBS).</p> <p>Some of the available specific standards are:</p> <ol style="list-style-type: none"> 1. Poultry feed (MS 212:1995) 2. Pig feed (MS 240:1995) 3. Animal feeds and feeding stuffs – methods of sampling and tests (MS 289-1:1991) 4. Animal feeds and feeding stuffs – methods of test – microbiological method (MS 289-4:1991) 5. Blood meal as livestock feed (MS 424:1997)

Good Manufacturing Practice	<ol style="list-style-type: none"> 1. MBS has quality mark for certifying companies producing products as specified in fertilizers and farm feeds regulations. 2. Farm feeds contains regulations for good manufacturing practice but this legislation is outdated.
BOTSWANA	
Legislations governing the industry	<p>Diseases of Animals Regulations, 1987 and (Amended in 2007)</p> <ol style="list-style-type: none"> 1. Controls the use of hormones and growth promoters, and 2. Outline how animal subjected to hormones should be treated and disposed <p>Diseases of Animals (Stock Feed) Regulations of 10th December 2004. regulates:</p> <ol style="list-style-type: none"> 1. Manufacture, labelling, retailing and feeding of Meat and Bone Meal, 2. Feeding of animal protein (swill) to animals such as pigs <p>Standards Act Section 13</p> <ol style="list-style-type: none"> 1. Provides compulsory standard requirements
Enforcing agencies	<ol style="list-style-type: none"> 1. Ministry of agriculture (Directorate of animal production) 2. Botswana National Veterinary Laboratory- certifies products of animal origin besides carrying animal disease diagnostics 3. Botswana Bureau of Standards (has compulsory and voluntary specifications for feeds)
Laboratory testing	Botswana National Veterinary Laboratory
Good Manufacturing Practice	No GMP legislations but livestock sector is well checked to meet stringent EU requirements.
ZIMBAMBWE	
Legislations governing the industry	<p>Fertilizers, Farm Feeds and Remedies Act [Chapter 18:12]</p> <ol style="list-style-type: none"> 1. Prescribes conditions for manufacturing, packaging and selling of animal feeds <p>The Farm Feeds (Amendment) Regulations 1997 (No 6)</p> <p>Prohibit feeding ruminant proteins to ruminants</p>
Enforcing agencies	<p>Ministry of Agriculture and Rural Development-Livestock and veterinary divisions.</p> <p>Standards Association of Zimbabwe (SAZ)</p> <p>NB: There are no compulsory standards.</p>
Laboratory testing	SAZ -Chemical and Food Technology Division of the Technical Services Unit provides quality, chemical/physical analysis, and specialist testing and advisory services for animal feeds.
Good Manufacturing Practice	No GMP legislations

KENYA	
Legislations governing the industry	<ol style="list-style-type: none"> 1. Fertilizers and Animal foodstuff Act [Cap. 345], 2. Standards Act [Cap. 496], 3. Animal Disease Control Act [Cap. 364],
Enforcing agencies	<ol style="list-style-type: none"> 1. Ministry of livestock development (Livestock development and veterinary services departments) 2. Kenya Bureau of Standards (KEBS) 3. Kenya Plant Health Inspectorate Services (KEPHIS) – phytosanitary regulations for importation of grains and other crop used in feed processing. <p>Others:</p>
Laboratory testing	<p>Kenya Bureau of Standards</p> <p>Some of Animal feeds standards include: (see also Appendix)</p> <ol style="list-style-type: none"> 1. <u>KS CAC/RCP 54-2009</u> Kenya Standard - Code of Practice on Good Animal Feeding 2. <u>KS 1647:2001</u> Kenya Standard - Code of practice for animal feed production, processing, storage and distribution.
Good Manufacturing Practice	GMP present and covered under feed formulation code of practice (<u>KS 1647:2001</u>)
SOUTH AFRICA	
Legislations governing the industry	<ul style="list-style-type: none"> • Agricultural Product Standards Act (Act No 11 9 of 1990) – determines the standards and requirements regarding control of the export of feed products. • Meat Safety Act, 2000 (Act No 40 of 2000) – determines the standards and requirements regarding control of the export of feed products. • Animal Health Act, 2002 (Act No 7 of 2002) – provides measures to promote animal health and to control diseases and regulate the importation and exportation of animals. • Occupational Health and Safety (Act No. 85 of 1993) which provides for the health and safety of persons at work. • National Environmental: Biodiversity Act, 2004 (Act No 10 of 2004) – provides for the management and conservation of South Africa's biodiversity. • Genetically Modified Organisms Act, 1997 (Act No 15 of 1997) – provides measures for managing activities involving GMOs.
Enforcing agencies	
Laboratory testing	
Good Manufacturing Practice	

There are three key GMP standard risk factors including assessment, management and communication. The following GMP Scheme is therefore standard for developed countries including South Africa and is recommended for the Kenya feed industry:

1. Risk Assessment

- HACCP should be drawn and implemented

2. Risk Management

Feed safety management includes the following:

- General requirements for the quality system
- HACCP criteria for risk analysis
- Additional requirements
 - control measures (additives, undesirable substances, microbiological status)
 - measuring strategy
 - tracking & tracing
 - recall procedure

3. Risk Communication

The pillars of risk communication are:

- Database risk assessment of feed materials
- Database analysis of undesirable substances
- Early warning system
- Crisis communication
- Publications / newsletters

In South Africa, the Department of Agriculture is the Directorate of Food Safety and Quality Assurance. It enforces the Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, No. 36 of 1947. It also invokes on regulations relating to the labelling and advertising of foodstuffs, R.1055, 8 Aug 2002 and regulations relating to maximum levels for metals in foodstuffs, No. R.500, 30 Apr 2004. The act no 36 has since been revised and the latest is that of 2008. The Department of Health has The Foodstuffs, Cosmetic and Disinfectant Act, No. 54 of 1972 and National Health Act, No. 61 of 2003 and enforces regulations governing general hygiene requirements for food premises and the transport of food, No. R.918, 3 Jul 1999

Driven by the strong will to make manufactured feed an integral part of food safety and achieve international feed and food standards the Government of South Africa Department of Agriculture worked with the Association of Feed Manufacturers (AFMA) Department of Health, South Africa Bureau of Standards and Parastatals and adapted the GMP standard Product Board Animal Feed (The Hague, The Netherlands, April 2003). In addition, they also used guidance from Codex Alimentarius Commission of the Food & Agriculture Organisation (FAO, EU) and Food & Drug Administration (FDA, USA). They used this information to establish Codes of Practice/Protocols for the feed industry that includes:

- GMP as National standard for animal feed production
- GMP transport protocol for raw materials
- Control of Salmonella in the production of animal feed
- Control of mycotoxins in the production of animal feed
- BSE protocol for the use of mammalian proteins in animal feeds
- Sampling protocol for animal feeds and ingredients
- Code of conduct for AFMA members
- Tackle problems at an early stage
- Improvement of communication

The revised Act 36 was completed end of 2008. The process followed to adopt the draft document of 2008 was:

- Voting on document
- Legal and technical adjustments to fit SABS requirements
- Publishing on SABS website and sent for public comments to all standard writing authorities
- Becoming legal national SABS standard

The GMP standard is now reviewed continuously by AFMA.

The government of Kenya has restricted imports and use of GMO products. There is need to consult widely and make an informed decision on imports and use of GMOs. In comparison, the Government of South Africa reviewed the scientific literature and consulted widely but concluded that GMO products were not unsafe. Thus, they formulated the GMO Act (15, 1997) to regulate development and use of GMOs in SA including import and export of living GMOs.

Similar to South Africa feed regulatory environment MoLD, MoH, KEBS, AKEFEMA and semi-governmental institutions are involved in manufactured feed regulation, however the Kenya regulatory framework is weak and dysfunctional. The role of AFMA and AKEFEMA in national feed regulation is different in that the latter is weak, has no management structure for self-regulation, currently has poor talent base and is not fully recognized by the MoLD as an organization that can play a key role in quality assurance.

In South Africa, the DoA regulates the feed industry working in strong collaboration with AFMA, a functional and self-regulated industry association. The AFMA controls more than 90% of manufactured feeds in South Africa and 10% is produced by known and registered private commercial livestock producers. Also, AFMA is self-financing and sustained by member levy. It has members who manufacture feeds and associate members who are raw material suppliers, transporters and some farmers. On the contrary in Kenya KEBS has the regulatory mandate, has 50% of feed manufacturers licensed and registered. AKEFEMA cannot sustain itself and relies on membership fees amounting to KES <1 million, and is not possible to collect member levies without a government amendment of Act 345 that gives mandate to regulate.

Kenya should also emulate the South African way to update or revise the Act CAP 345 to strengthen AKEFEMA's regulatory role and adapt international standards. All parties including the MoLD, KEBS, MoPH, AKEFEMA and stakeholders should meet and draw a work plan to achieve this without reinventing the wheel. Recommendations for government policy formulation should be fact based deriving from where the industry is and its known potential. The process should be realistic with clear milestones and a conducive regulatory framework.

6. THE ROLE OF AKEFEMA IN KENYA ANIMAL FEED INDUSTRY

6.1 History of AKEFEMA

AKEFEMA is a canopy organization of accredited feed manufacturers in Kenya. It was established in early 2003 and registered in 2004 under Section 10 of the Societies Act. With MoLD persuasion, its formation was driven by the need to enhance quality and affordability of feed stocks and services delivery in the feeds industry. This was perceived as a necessary condition for future growth and development in the livestock sector. Limited availability of good quality, affordable feeds has been a setback for the livestock sector in Kenya. As noted earlier, farmers attribute decline of milk production to poor quality of feeds that are produced locally and/or non-affordability of these feeds due to high feed prices. Therefore, there was need for stakeholders to create a body that would help alleviate these challenges.

Currently, AKEFEMA has over 100 registered members. Its core mandate is to coordinate and promote self-regulation in the feed manufacturing industry and lobby for feed industry enabling environment. Other roles of AKEFEMA include steering of animal nutrition research activities, disseminating knowledge on animal feeds manufacturing, promoting market access by livestock farmers through collective action, link its members with both government and non-government organizations, and providing a platform for public-private partnership in the feed industry.

AKEFEMA is in the process of developing its certification codes in the form of 5-star rating which will be granted to its members after a comprehensive appraisal of the production process and procedure. This certification will ensure quality feeds to consumers since rating will help to instil consistency in production of animal feeds. The rating system is in harmony with KEBS standards as well as international codes of practice. See Appendix Table 5 for the 5-star rating criteria.

6.2 Willingness of AKEFEMA members to build capacity

- Following a successful Kenya Dairy Sector Competitiveness Program (KDSCP) commissioned sensitization and capacity building program (Ahead Consultants 2011) AKEFEMA members cooperated and honoured their pledge to enrol their staff for full training as part of reform implementation process. This training was realized by a two day workshop conducted at AMREF Nairobi.
- Most directors indicated willingness to partner and cost share with donors to build capacity for good manufacturing practices. This activity could be on going but has not yet had impact.
- Inception of GMP training was to start with a pilot group of about ten feed mills and later enrol the other subsequent groups of ten. The previous AKEFEMA management committee followed up on this however, the impetus has slowed down since the election of the standing committee.
- The recommendations were also that accreditation process be included in the HACCP/GMP course modules. This was partially realized through assistance of other NGO's including Winrock International who sponsored a US Consultant to carry out a capacity survey of existing laboratories. Also, AKEFEMA was assisted to engage a consultant who developed the 5 Star feed rating. The 5 star rating was reviewed by the AKEFEMA's technical committee in 2012.

6.3 AKEFEMA achievements

Since its formation, the umbrella body has played a key role of bringing stakeholders in the feed industry together for the purpose of improving service delivery. Some of its key achievements include facilitating the formation of Kenya Poultry Association (KEPOFA), lobbying for importation of yellow maize as an animal feed ingredient, and collaboration with Kenya Bureau of Standards (KEBS) in execution of the standard mark sign of quality with the aim of eliminating counterfeit feed products. Additionally, AKEFEMA partnered with the MoLD in conducting a baseline survey on the state of feed industry in Kenya. The organization is also in the process of improving feed processing consistency through the 5-star certification. In 2012 AKEFEMA presented the "Grain Crisis" paper to the highest policy makers pleading for zero rating of ingredients. The success of this was that they received a response from the Director Ministry of Livestock. It is important to note that once budgets are earmarked it becomes difficult for government to rescind the earmark. Hopefully, the AKEFEMA 2012 plea will be considered in the 2013 budgeting exercise.

6.4 Targets/priorities

In its strategic plan for 2009-2012, AKEFEMA outlines a number of targets which are in-line with its mission in the feeds industry. They include strengthening its organizational capacity through developing appropriate policies and generating resources that would improve its service delivery to members, and engaging development partners to promote efficiency and coordination in the feed industry.

Despite AKEFEMA having an ambitious strategic map, low membership, weak governance and fiscal constraints have hampered its lobbying efforts. These limitations have led to laxity among its members. Possibilities for strengthening AKEFEMA are further outline in the following sections.

6.5 Weak leadership and governance structure

The organizational structure of AKEFEMA consists of an executive council, regional representatives, special committees, regional membership and the secretariat office. However, despite having well outlined offices, the organization lacks skilled manpower to handle critical aspects such as research and development. Transparency, accountability and independence within any lobby group determine its success in organizing and influencing the government to create an enabling environment for the industry.

However, because of reliance on government resource support, the independence of AKEFEMA in carrying out its mandate of regulating feed industry self-governance has been questioned. For instance, the organization is housed by the MoLD. Furthermore, there is concern over leadership whereby the executive council is headed by representatives of the large feed millers. This creates risk of dominion in favour of large scale millers which might compromise competitiveness of the emerging feed manufacturers.

The AKEFEMA governance structure lacks key functions such as extension and capacity building services, laboratory services for quality monitoring and control, market intelligence system/mechanisms, and the capacity to influence enforcement of control measures. The market intelligence system is useful for identifying the technology trends in feed processing whereas extension helps to disseminate gathered knowledge to the industry players and consumers. A laboratory would be useful in providing quality controls amongst member products and also first-hand facts which would beef up their argument in lobbying processes.

6.6 Financial constraints

The main source of finance for AKEFEMA is the members' annual subscription fees (currently KES 15,000/member) and grants. As such, the operations of the organization are under-financed ⁽⁸⁾. Financial strength promotes development of a vibrant team of employees but in the case of AKEFEMA, the main functioning office is the secretariat. For successful regulation of industry and lobbying, AKEFEMA needs to support its argument with empirical facts based on research findings. However, financial constraints have played a large role in weakening governance and, in general, AKEFEMA performance towards achieving a favourable environment in the feeds industry for its members. It is important to note that unlike organizations like the Horticulture Association that has a successful self-regulation program, the animal feed manufacturers do not face imminent regulatory threats that would force them to comply to standards, the market is large, and hence attracts crowding-in due to low entry barriers. Feed products users are equally silent to suppliers and do not demand certificates of conformity as a basis for procurement. The manufacturers are equally not compelled to have functional insurance against their feed products. Despite some donor programs to facilitate AKEFEMA capacity building towards self-regulation, poor feed quality prevails and the consequent low livestock production efficiency continues unabated. All this is happening because AKEFEMA has no mandate to charge levies to its members without an Act of Parliament authorizing them to do so. Thus, annual membership fees are a drop in the ocean and they are limited as to hiring competent staff or carry out significant programs.

6.7 AKEFEMA Member SWOT analysis and action plan

Following pressure from stakeholders in the feed industry, AKEFEMA stands out as a unifying body for self-regulation. It is recognizable that continued production of sub-standard feeds by unscrupulous millers will taint the name of all industry players equally; hence, self-regulation is vital. The SWOT analysis of the AKEFEMA Members (Table 4) is presented to create a basis for recommendations on AKEFEMA capacity building and an empirical action plan for improved service delivery. It should be noted that the AKEFEMA association is only part of a large feed producers group this while its members might have good practices, the existence of a large non-member group poses a risk in failure to conform to set standards.

To regulate and develop the feed industry at macro and national level, it is questionable whether AKEFEMA as a membership and lobby organisation, constitutes the right body and has adequate mandate to govern and (self-) regulate the feed industry.

Government needs to play a pivotal role and cannot afford to shift the responsibility of regulating and developing the sector on behalf of the many different stakeholders, amongst which there are farmers, processing industry, consumers of animal products, seed suppliers, labour unions, training institutes and so on, to AKEFEMA, which is only representing one of the stakeholders, namely the feed manufacturers.

International best practice shows that an Animal Feed Board, or a similar public-private governed institution that looks at the interest of all the stakeholders across the value chain with a wider mandate and ability to collect levies and cess, is a much stronger vehicle to transition the industry.

⁸See projections of AKEFEMA in the annex

Table 4. AKEFEMA Members SWOT Analysis.

	<p>OPPORTUNITIES</p> <ol style="list-style-type: none"> 1. Rapidly growing feed industry with increase in new feed millers (can strengthen lobbying for government action by creating sufficient numbers of lobbyists) 2. Growing demand for quality feeds by farmers (bolsters self-regulation). 3. Feed value chain efficiencies can be improved by better planning, contract farming and self-regulating industry associations 	<p>THREATS</p> <ol style="list-style-type: none"> 1. Influx of poor quality imported feed ingredients 2. As a consequence of weak regulatory control, counterfeit feed products influx. 3. As a result of high feed ingredient costs, there could be substandard ingredients influx. 4. With the impending election in 2013, policy integrity is not guaranteed.
<p>STRENGTHS</p> <ol style="list-style-type: none"> 1. Some experienced staff mainly businessmen in the feed manufacturing with strong technical knowledge of the feed industry in Kenya. 2. Recognition of AKEFEMA by the government (good relationship with the government). 3. Wide membership base. 	<p>Leveraging strengths to benefit from opportunities</p> <ol style="list-style-type: none"> 1. Strengthen capacity of AKEFEMA to self-regulate, develop an implementation plan with key performance indicators and establish a feed seal of quality (SOQ) 2. Develop an incentive based program that recognizes feed millers market leaders and innovators 3. Work with GOK/KEBS to formulate frameworks that crowds-out & establish SOQ. Furthermore, seek assistance for funding Market Access Programs 4. Rebrand and promote benefits of quality feed use 	<p>Use of strengths to minimize impact of threats</p> <ol style="list-style-type: none"> 1. Formulate regulation on ingredient quality and use to regulate imports of sub-standard materials 2. Build capacity to produce ingredients locally through contract farming and guaranteed off-take agreements for soybean, sorghum and other small grains that have less competition with traditional human foods such as maize. 3. Reduce threat of poor confidence in feed quality by sensitizing farmers on need to look out for the KEBS Standardization Mark on feed products

Organizational Factors

WEAKNESSES	<i>Ensuring mitigation of weakness from negatively impacting opportunities</i>	<i>Fixing weaknesses to mitigate adversity of threats</i>
<ol style="list-style-type: none"> 1. Inadequate financing 2. Lack of support to existing facilities and basic investment in quality control facilities /laboratory 3. Poor knowledge of ingredient sources and procurement 4. Inadequate publicity of AKEFEMA, hence it's only known in Nairobi. 5. Weak organizational structure 6. Compliance laxity by its members 7. No clear benefits to members nor incentive schemes 	<ol style="list-style-type: none"> 1. Develop an effective secretariat Management/ Org Chart for AKEFEMA and job descriptions. Do a work and implementation plan with key performance indicators 2. Develop a comprehensive budget & revenue streams plan to realize the budget sum. 3. Define benefits and incentive schemes for joining AKEFEMA and market these to industry stakeholders and millers. 	<ol style="list-style-type: none"> 1. Ensure there is clear vision and strategy to implement, supervise& monitor AKEFEMA activities 2. Seek financial assistance and sound financing structure to enable and guarantee asset financing for ingredient contract farming

7. SUMMARY ON KEY INFORMANT INTERVIEWS

To examine the feed industry systems and processes and gather information to better understand the institutionalization standards and regulatory framework governing the animal feed sub-sector and generate recommendations, key informant interviews were organized for the government industry regulators (MoLD, KEBS, KEPHIS, & Public Health), feed producers association (AKEFEMA), and institutes (KIPPRA & Tegemeo). Appendix Table 4 lists the key informants interviewed, their organization and designation.

7.1 MoLD

The MoLD staff recognize that the feed subsector has feed quality challenges and it lacks integral chain management and control. The roles of the Departments of Livestock and Veterinary Services are conflicting. There has been confusion over the feed inspectorate with disfunctioning analysts and inspectors (Section 8 of CAP 345). They observed that apparently nobody is enforcing the law. They also note that a major constraint is poor feed raw material supply chain resulting in poor formulations and inflated feed costs. CAP 345 is supposed to be enforced by the Veterinary Department because of the sanitation issues arising from use of meat and bone meal as a component of animal feeds. But there are many other ingredients besides that component. This has been acknowledged by KEBS at the committee level and there are now 2 committees, one for meat and bone meal for making animal feeds and the main one on animal feeds.

Efforts to update and reform CAP 345 has been full of controversy with issues arising on who should implement the revised Act (the DVS or the DLP) and on the content of revised Act. How much consolidation should be allowed in licensing, standards, inspectorate, analysis, environmental issues, etc. with some wanting the Act to continue with analytical and inspectorate only and the rest stay in other legislations.

The MoLD may have been involved in initiation of the formation of AKEFEMA (around 2003) though the effort may have started in the 1990s, for the purpose of the industry self-control and have capacity to lobby for the interest of the industry. AKEFEMA should have mechanisms for e.g. sanctioning and certifying.

The MoLD acknowledges the existence of private laboratories and their weakness of lack of accreditation to ISO 17025. There are some modern equipment including NIR with KEBS and KEPHIS that seem not to have been set-up due to lack of expertise. In its mandate for strengthening capacity of the Dairy Centre of Excellence (CoE), which focuses on strengthening the human resource and physical infrastructure capacity, EAAPP has supported the Feeds laboratory at the Naivasha KARI Centre. For sustainability of laboratory services, the main areas to address include (i) type of machinery/equipment (are they serviceable locally and modern), (ii) personnel (capacity for analytical workload – their qualification) and (iii) capability/capacity to make money to maintain the services (is the laboratory managed as a business?). The lab should also market its services through provision of quality services.

Other critical issues in the feed industry in Kenya include: 1) the knowledge gap with the animal feed users, the farmers; 2) lack of feed raw material, maize and the alternatives, 3) human competition in maize and inadequate quantities of the alternatives raises cost of production. The country does not produce enough raw material for the animal feed industry and therefore is vulnerable to situations in countries like Uganda and Tanzania.

The issue of mycotoxins and food safety is not properly documented nor well understood. There is need for educating animal feed stakeholders on mycotoxins. There is tendency of using cereals rejected in manufacture of human food on animal feed regardless of the reason for rejecting.

The Ministry would appreciate effort to facilitate and see through the work on policy and legislature completion, effort to address the bridging of the protein and energy gap in feed manufacturing. There is need to convince the industry and the government to look at animal feed from the perspective of food security issue.

7.2 Ministry of Public Health interview

Consumers are made aware of public health issues and are made to understand the risks. The Division focus on food issues (no capacity for broader issues such as feed) and refer any feed issues to MoLD (Vet and Livestock Production dept). The Division however concerns itself with storage facility for the feed – inspection of the premises and can prosecute for any breach of the requirement for proper storage.

There are mainly two areas of convergence with other Departments of the Government such as KEBS, KDB, MoLD, etc. – at the standard formulation – they are members of the Feed Standard committee at KEBS and are involved with the standard making process; and they also participate at the National Codex (local) committee. The MoPH provides the secretariat for the National Food Safety Co-ordination Committee which also deals with issues on food and feed safety in Kenya where other arms of government participate. Because of the possible safety risks arising from food chain of animal origin, food safety is now referred to as Food and Feed safety.

Mycotoxins have become a major issue. Some hot spots of mycotoxins were identified, like in Machakos. The Food Safety Committee position on GMO is dependent on results of thorough risk analysis on food safety, done by experts. As long as risk assessment is done and issues of concern are addressed and looked at beyond reasonable doubt, the committee considers it safe. On side note on recent issue of Cabinet directive on ban of importation of GMOs, it was observed that this was not permanent pending recommendation of a committee appointed to review the issue and advise accordingly. But this is a government directive which the committee on Food safety cannot contradict for the time being.

The procedure for allowing GMOs into Kenya is spelled out in the current legislation on food safety. Even if his division refers feed issue to the authority in MoLD, they can confiscate and/or destroy any material that has any risk implication to humans even if passed by the other authority.

7.3 Tegemeo

Tegemeo is a policy arm of Egerton University under Research and Extension Division and has been operating autonomously but it is being integrated back to the University system. It conducts agricultural and rural development research. Its mandate is to carry out different aspects of research and outreach (dissemination). While Tegemeo research was focussing largely on crop agriculture, soon it will shift towards on livestock research, particularly in the marginal areas. They engage policy makers through provision of evidence based information and materials i.e. paper, publications, workshops/conferences, meetings, etc. They are involved in many agricultural sector working committees for various policy outreach activities – five thematic working groups/task forces/teams under ASCU. They are in a better position to understand where research is required.

Their view is that Kenya should first determine its an evidence-based policy after a wide consultation of the stakeholders including issues such as quality, price, ethics/integrity and access and availability of feed.

Kenya lacks policy champions who can also popularize policy recommendations. Tegemeo has carried out livestock research, but only little has been done in dairy and poultry. Their research on feed issues focused on production costs but not quality. There are areas that need policy interventions especially ensuring that farmers have sufficient fodder throughout the year.

7.4 KEBS

The Kenya Bureau of Standards (KEBS) is the guard of animal feeds standards and quality control. It is strategically positioned with regional offices in all provinces of Kenya. National institutes such as KEBS do not require to be decentralized into the County system. KEBS mandate has 3 roles:

1. Deployment of animal feeds specification standards, testing methods and labelling,
2. Enforcement feed quality control under good manufacturing practices,
3. Laboratory testing and reports per public requests.

KEBS recognizes that the industry is huge, spanning from backyard feed compounders, small and medium enterprises to large feed mills. Their mandate is from the Fertilizer and Animal Feed Act Cap 345. The policy effectiveness relies on scientific results and on development of appropriate quality standards, addressing veterinary and environment-related issues. The role of KEBS is to polish the whole industry with the final goal to service to all Kenyan citizens.

If associations such as AKEFEMA are erected, KEBS welcome them and encourages them to self-regulate as this complements their role. It should be noted that AKEFEMA is a private affair and KEBS can only encourage them to address issues of common concern but cannot force other millers to join AKEFEMA. To encourage more entry of entrepreneurs into animal feed milling, KEBS has a subsidy program for SMEs. It can inspect and has powers to shut down licensed millers failing to meet standards and quality control and unlicensed millers. Also, KEBS encourages private laboratories to be ISO 17025 certified for competence and this can be done through the Kenya National Accreditation Service (KENAS). Once accredited, KEBS allows private laboratories to compete fairly for service provision and are willing to partner in determining feed quality when need arises.

The KEBS regulatory framework is in collaboration with local stakeholders. Regional harmonization of regulations and standards has been initiated and is on-going through East African Countries and COMESA Bureaus of Standards. Once standards have been developed and harmonized regionally, then the regional standards take precedence to the national standards. Importations of raw materials or feed products from regional countries to Kenya should then meet those standards. The border check points should inspect and verify that imports conform to country of origin stipulated quality marks of standards. On imports, KEBS testing is random and if products fail to comply with standards KEBS takes up the issue with the country of origin.

The aim is to use standards that the industry can attain and also to ensure food quality for animals and food safety for human consumers. This is achieved through a Technical Standards Committee for animal feeds. KEBS uses qualifications and experience to select members who serve for a period of a renewable 3 year period and it constitutes this committee as follows:

1. Key stakeholders
2. Feed millers/manufacturers associations
3. Government regulators (MOLD, DVS, Public Health)
4. Testing organizations (Laboratories)
5. Institutes (Research, Universities and Colleges)
6. SMEs

“The industry has over the years experienced numerous challenges with regard to the regulation of the industry due to the rapid growth of the sub-sector and entry of producers who have limited knowledge on animal nutrition, feed quality and safety and inadequate database on available raw materials”, said KEBS Director Standards Development and International Trade, Eva Oduor.
KEBS -The Benchmark Issue 1 Sept 2009

Challenges:

- i. Manufacturers have problems buying raw material of sufficient quality.
- ii. While KEBS constitutes a representative committee to set the standards they are not often met. One of the reasons is that AKEFEMA is only part of the industry millers. While AKEFEMA members might comply other non-members may not and the blame goes to the whole industry.
- iii. While the S-Mark exists feed industry awareness of its presence and benefits remain low. As such few reports on S-Mark abuse or non-compliance are received at KEBS thus resulting in mass non-compliance.
- iv. Low fiscal funding and MOLD also needs to place more effort towards feed industry standards and compliance.
- v. Fiscal funding is low as such random sampling of S-mark registered millers is done quarterly.

7.5 KEPHIS

The KEPHIS services are regulatory for agricultural imports - mainly for phytosanitary control and certification. The KEPHIS laboratory conducts analyses on fertilizers and pesticides and registers new innovations. Mainly, it checks agricultural contamination and the presence of pests or other insects. KEPHIS has a well-equipped analytical laboratory and has analytical capacity for animal feeds. Although the mandate of KEPHIS does not extend to animal feed, it can conduct analysis on demand or for interested clients. Also, the laboratory can test for presence of GMO materials. KEPHIS has no problem with GMO products and also confirmed that yellow maize is already being produced in Kenya as sweet corn. According to KEPHIS, there are many arms of government overlapping in some aspects of inspecting imports. While different expertise is necessary, responsibilities should be streamlined for cross-departmental trust which is absent at present. There is, therefore, need for:

- Harmonization of laboratory, regulatory and inspectorate services. The European structure is a good model to consider. There is also need for a law to allow for regulation enforcement and monitoring.
- Continued training of scientists for various fields of expertise is required and also proper equipping of labs.
- Services available in various labs should be harmonized, analytical role of individual laboratories specified, and a hierarchy of reference laboratories for specific analysis established.

7.6 KIPRRA

KIPRRA attributes high cost of feeds, 60-80% of the production cost in livestock farming (cited by session paper No. 2 of 2008 on National livestock policy) to high fertilizer costs for growing fodder, ingredients cost, fuel, and other processing and distribution fees. Other factors include feed scarcity due to seasonality in feed production, consumer's perception on feed quality poor concentrates manufacturing skill and poor enforcement of the regulatory framework.

Table 5. Key Informants, Organization and Designation

Date	Organization	Key Informant/s	Designation
23/1/2013	AKEFEMA	Dr. Charles Mwendia	National Chairperson
14/1/2013	Ministry of Public Health (MoPH)	Robert M Kilonzo	Head of Environmental Health and sanitation Division of food safety and Quality Control
14/1/2013	Ministry of Livestock Development (MoLD)	Mrs. M. W. Mwambia Dr. Mutua Mr. Githinji	Director in-charge of the Livestock Feeds and Services Assistant in the Livestock Feeds and Services Former Director in-charge of Livestock Feeds and Services
21/1/2013	Kenya Bureau of Standards (KEBS)	Ms. Evah Oduor Mr. Joel M Kioko Mr. John W. Abong's Mr. Charles G. Gachahi	Managing Director Director Metrology & Testing Director Quality Assurance & Inspection Chief Manager Standards Development
17/1/2013	Kenya Plant Health Inspectorate Service (KEPHIS)	Dr. Esther Kimani Abed Kagundu Mathagu Rosemary Nganga	General Manager, Phytosanitary Services Head, Biosafety and Phytosanitary Services Head, KEPHIS Analytical Lab
23/1/2013	Kenya Institute of Public Policy & Research Analysis	Dr. John Omiti	Director
18/1/2013	Egerton University Tegemeo	Dr. Lilian Kirimi	Research Fellow at Tegemeo

8. DISCUSSION AND RECOMMENDATIONS

8.1 Kenya commercial feed quality gap – the weak link

Beginning in the 1980s, the government of Kenya instituted economic and institutional reforms that aimed to improve economic performance and macro-economic stability. The major dairy reforms included: (i) selling veterinary drugs at full cost in 1988, (ii) price liberalization for animal feeds in 1989, (iii) transfer of the management of cattle dips to community groups in 1989, (iv) privatization of artificial insemination (AI) services in 1991, (v) decontrolling of milk prices and liberalization of the dairy sector in 1992, and (vi) privatization of clinical (veterinary) services in 1994.

According to Nyariki (2009), the weak aspects of liberalization can be summarized as follows: “Liberalization was done gradually within the dairy industry and across related sub-sectors. Reforms were, therefore, not adequately synchronized across sub-sectors and thus some sub-sectors have not kept pace with the changes.” This is a major factor in understanding the current feed sub-sector state which is similar to that of the milk processing (KDB) and AI breeding sub-sectors. Interventions and policy reform should therefore understand how to privatize effectively and implement reforms to achieve the intended goals of sustenance and to holistically benefit the feed sub-sector.

Similar to other liberalized dairy sub-sectors, the commercial feed sub-sector illustrates some of the effects of partial or limited privatization. Partial privatization has had a profound effect on milk processing, feed producers and dairy services (AI, Animal health and extension) provision. Dairy processors pay cess of 1 cent per litre of milk to KDB, registered and licensed feed manufacturers are subjected to 0.2% feed levy paid to KEBS via KRA and genetic importers pay KES 20 per unit of semen imported. The levies are meant to sustain a functional regulatory framework for the respective processing, feed and breeding sub-sectors. However, there is a discrepancy as to value proposition of levies to feed businesses. The anticipated benefit of feed S-Mark license enforcement and stipulated feed regulations are yet to be fully realized.

In order to realize the full potential of its dairy sector, Kenya must complete the drive to fully privatize the agribusiness sector of the dairy industry. In an environment where public resources are scarce, the dairy industry, which is Kenya’s leading agriculture business, will never realize its full potential depending on such declining resources.

Case in point is the weak regulation of the feed sub-sector by the mandated regulator, the Kenya Bureau of Standards.

Zimbabwe Feed Mill Licensing

1. Application to City Council for building permit & submission of architectural building diagram detailing production room, ingredient storage, finished products storage, separate & lockable storage of micro nutrients and additives, staff changing rooms, staff washrooms & Canteen. Final permit is issued on supervision & successful completion of building – occupation certificate
2. Fire Brigade certificate –application to the City Fire Department to survey and install required fire equipment
3. Standards Association of Zimbabwe issues a certificate of products standards
4. Registration to the Agricultural Marketing Authority is a requirement for all institutions and/or individuals intending to buy or process grain
5. Finally, **Operating Permit** is obtained from City Health Department who only issue a permit after premises inspection and verification that all licenses are in place.

The introduction of the Standardization Mark (S-Mark) was meant to curb unreliable commercial feed quality by ensuring that all commercial feed manufacturers are registered and licensed. Attaining the S-Mark entails paying KES 7,500/product fees to register each manufactured product and also the manufacturer pays to KEBS via KRA a levy of 0.2% of total value of feeds manufactured and sold per month. The big questions are: 1) Are manufacturers getting benefits for the value of collected levies? 2) Under the prevailing weak licensing enforcement, are S-Mark compliant / licensed manufacturers being treated fairly?

To curb bad business practices and strengthen the regulatory and enforcement of standards requires effective elimination of unlicensed feed manufacturers. The KEBS S-Mark licensing should be urgently reviewed to avoid the current automatic approval of production and distribution of commercial feeds without verification that the applicant has acquired all other required compliance permits. The S-Mark should only be issued as a final step after verification that the applicant has obtained all other required permits including building/construction certificate, fire brigade permit, NEMA, City Council business permit, public health and KEBS feeds standards certification. Also, all feed manufacturers should register as members of a manufacturers association such as AKEFEMA. Registration to a feed manufacturers association increase levy revenue and enables industry records and dynamic information collection system.

In line with the full liberalization of the dairy sector, the feasibility of transferring the KEBS levies to an industry Association that is committed to self-regulation and a feed seal of quality program should be examined. Hopefully, this enables the forces of demand and supply to determine the production, distribution and marketing of feed products and services in the sub-sector and thus promote efficiency, quality and competitive livestock production.

8.2 Legislation

Although there has been a never progressing effort to review the livestock feeds policy and legislation, the industry stakeholders should review the existing Acts and regulatory framework with a view to establish a competitive and vibrant livestock sector sustained by a dynamic system that responds to sector developments in real time. There must be a seamless flow in management of the legal and regulatory framework and the responsible institutes should be reviewed, reformed and adequately resourced to fulfil their mandate. Even if the Ministry of Livestock Development is the major stakeholder who should lead formulation and enforcement of animal feed legislation and regulations, the other stakeholders should fully be involved. The vision is to have an industry that has competitive livestock products, a sustained profitable sector that promotes equitable access to animal feeds, and sustainable natural resource management and use.

8.3 Suggested way forward in the administration of the Kenya feed industry

The National Livestock Policy 2008 suggested “the formation of Animal Feed Inspectorate Service (AHIS) Board established to ensure that livestock products for local and international markets meet standards safe for human consumption. The Board will be charged with quality assurance and marketing of animals and animal products locally and internationally. Further, it will register and license all feed firms or individuals involved in commercial feed production, and other inputs to ensure that feed quality standards meet the physiological and production requirements of the relevant livestock species. The Fertilizer and Animal Foodstuff Act Cap 345 revision should be completed as a matter of urgency and together with other food safety regulations should guide the operations of the Board.

This was a great suggestion that needs to be developed further through establishment of a designated position to administer the Feeds Act. This will include ascertaining the resources required by Government in order to effectively implement the revised Act, Cap 345, in collaboration with a revamped feed industry self-regulatory body. A realistic budget should be made and funded to ensure viability of the position. AKEFEMA had requested to be granted this mandate but was not approved. It will be prudent to review this position with a view to create an independent body with statutory mandate to regulate the feed industry like the Kenya Veterinary Board or the Kenya Dairy Board.

8.4 Self-regulation of animal feed manufacturers

AKEFEMA formation was a result of few feed millers responding to a crisis and partly through MoLD persuasion that followed feed industry non-compliance to feed quality standards complaints. This genesis has somewhat estranged AKEFEMA from its feed industry constituency which would give it leverage on issues such as promoting self-regulation. To date, feed industry players face no imminent regulatory threats besides loss of business loyalty. Currently, the feed industry lacks a market leader and its activities approximate a race to the bottom of the pyramid.

There is urgent need to remobilize and sensitize animal feed manufacturers to re-license and conform to S-mark standards as a way to eliminate crowding in tendencies, and the consequent downward pressure on prices as a result of overcapacity. To some extent, AKEFEMA needs rebranding as to be recognized in law as a stakeholder self-regulatory association and has to refocus on self-regulation or it will remain a toothless feed industry lobby group that risks the extremities of external control.

Self-regulation and improvement of the level of compliance would start with developing a realistic code of good practice for animal feed manufacturers, standard sanitary operating procedures, standard operating procedures, and establishing good manufacturing practices. Its secretariat needs strengthening and staffing with competent talent that can elevate the organization to greater heights. Following development of a realistic and effective management structure, a strategic plan that includes a comprehensive budget, implementation plan and key performance indicators/milestones needs to be developed.

Secondly the KEBS S-Mark inspection and surveillance services must be provided with the necessary skills and resources in order to effectively enforce the law within the animal feed regulatory framework.

AKEFEMA alone will not be able to reform the feed industry. This requires the government to set a level playing field regarding standards and operations of the industry and to enforce this vigorously. AKEFEMA should strongly lobby for this, to curb and stop crowding in and operations of non-skilled and non-transparent entrepreneurs in this sector. In addition, AKEFEMA members (or likely part thereof) could think of creating a framework that provides incentives to market leaders to form a separate organization or section within AKEFEMA that can self-regulate and in return benefit from a wide market created through self-imposed operational licenses and certifications aimed at branding. The organization should have incentives for its members to benefit including market promotions, asset financing options and strong supply chain linkages.

8.5 AKEFEMA's mandate and objectives – the misunderstood role

The Association of Kenya Feed Manufacturers (AKEFEMA) is an umbrella body that brings together Kenyan producers of mixed animal feed. It was formed before 2000 as part of the liberalization efforts. However, AKEFEMA popularity heightened in 2003 as a result of the introduction of the Feed Bill. The 2003 Draft Feed Bill was not well informed as it lacked adequate consultation to understand prevailing circumstances. The draft Feed Bill prescribed exorbitant penalties that were 10-fold greater than existing feed company investment values. The scare of feed business extinction united AKEFEMA members to lobby against the adverse bill. This was successful and clearly demonstrated to members that their nascent enterprises were vulnerable unless they form a strong lobby group to address issues of common concern. To that effect the Department of Livestock Development through ASCU assisted AKEFEMA to have secretariat offices at the Bee Keeping Centre at Lenana. Given the weak feed standards regulatory and enforcement AKEFEMA became the icon and assumed association to rectify the feed sub-sector shortcomings. The association has cooperated well with KEBS, is part of the standard formulation committee and most members of AKEFEMA have registered for the S-Mark. Attempts by AKEFEMA to use KEBS to coerce all feed manufacturers to be members remain unsuccessful as the latter views its mandate as that to serve the nation and AKEFEMA membership should be on choice basis. AKEFEMA contributed to the Draft Feedstuff bill and lobbied to have industry statutory role and mandate to be regulator similar to the Veterinarians who have to be members of the Kenya Veterinary Board. Although their plea was not granted AKEFEMA is now a recognized member of the Ministry Advisory Board.

Currently, AKEFEMA cannot charge its members a levy to sustain an efficient management structure and build capacity towards self-regulation. This is the major weakness to AKEFEMA's functionality and inability to capacity build towards self-regulation. Out of the estimated >150 feed manufacturers only 57 (<40%) are active AKEFEMA members and only <60 feed manufacturers are S-Mark registered. The rest are underground feed manufacturers some of whom are engaging in bad business practices such as fraud-associated feed production and repackaging. To this extent, it is imperative that unfair blame and inappropriate expectations have been directed against AKEFEMA. Fact-based analysis is necessary so as not to blame to the reforming sector members unjustified.

The priority areas for AKEFEMA in the year 2010 are geared towards improving the members' capacity to produce high quality feeds (Ahead Consultants 2011). Key informant interviews with the AKEFEMA Chairperson and other members confirmed that the interest remains the same but there are no immediate plans or milestones to achieve this goal. Acknowledging assistance from the government and donors, the slow progress is attributed to several factors including lack of adequate finance and capacity needed. The AKEFEMA annual budget is less than KES 1 million, employs one full time staff member and besides part time engagement, management members operate on their personal funds. The current AKEFEMA Secretariat is a recipe for apathy and cannot be expected to achieve milestones beyond being an effective lobby group.

If AKEFEMA is to attain self-regulation, several bottlenecks need to be addressed:

- Policy institutes should be co-opted to research and ascertain the exact number of feed manufacturers, their license status and what would it cost to establish a functional self-regulation association.
- Through amendment of the CAP 345, AKEFEMA should be given a mandate to self-regulate and charge appropriate levies to its members. Self-regulation will be more sustainable than the existing public sector driven S-Mark regulatory framework.

- KEBS should convene a meeting with feed sub-sector industry to discuss efforts towards enforcing feed manufacturing and distribution licenses. Underground feed manufacturers should be eliminated and all players registered and licensed if standards enforcement is to be functional. Currently a third of the players are paying and receiving blame of the industry ills. Consonant to FAO 1993 report, capacity building of KEBS staff is critical. Also, KEBS should reduce reliance on whistle blowers as a means to identify unlicensed feed businesses but should deploy a proactive competent inspectorate to police the sector.
- There is an opportunity to initiate self-regulation of few current market leaders who understand benefits of a strong consistent quality based feed brand. Donor funds can then be used to facilitate establishment of the feed seal of quality program. Eventually levies collected by KEBS could be transferred to the successful seal of quality program.

Animal Feed Board

Most important however for diligent governance of the feed industry and to maximise its impact on the livestock industry and the issues of food security and food safety, is not the ability of AKEFEMA to self-regulate. Prior to that and more fundamental is the role and responsibility of the government to consolidate fragmented policy and regulatory functions, to create a transparent and credible level playing field for the industry, based on Good Manufacturing and Managing Practises, and to enforce forcefully and diligently the standards set to promote sanity, food safety and fair competition across the board. This also requires rethinking and redesigning the institutional framework governing and guiding the industry, and calls for a strong well equipped and mandated Animal Feed Board, or a similar public-private institution that represents the interest of all stakeholders and has the mandate to levy for both enforcement of standards and development of skills and competitiveness.

In sub-report II of the wider animal feed and fodder study, the model of the Dutch Product Board Animal Feed is presented. It is argued that it could serve as a learning-case for Kenya to regulate its animal feed sector. Annex 1 of sub-report II gives an overview of the mandate and the operations of the Dutch Product Board Animal Feed.

8.6 Building confidence and perception on feed quality and safety

Government and the successful industry self-regulatory body should discuss market access and market promotion funds that through generic media and other intervention programs ensure that the public and stakeholders are dynamically informed about animal feed products and benefits in livestock production efficiency at all times.

8.6.1 Feed analysis laboratories

The livestock feed industry should restructure to form a clear institutional framework with proper structural arrangement for laboratory/analytical, regulatory and inspectorate services which are supported by policy and legal framework. It cannot be overemphasized that the essence of re-establishing a functional feed manufacturer's association is to convert AKEFEMA to self-regulation. The association can enhance and strengthen the capacity to test animal feed products. This would entail upgrading and accrediting the existing private and public laboratory equipment to enable competent and efficient testing/analysis. The Eastern Africa Agricultural Productivity Project (EAAPP) actually has funds for upgrading laboratories and further linkages in this regard are encouraged. This should also include capacity building in technical skill on latest technologies and laboratory equipment operations and maintenance.

8.6.2 Feed procurement based on certificates of conformity

Farmers should be sensitized to have binding commercial feed supplier agreements. All feeds sold should be traceable and have a laboratory certificate of conformity to standards.

As part of best feed procurement practice, producer organizations, dairy societies and farmers should be sensitized on the need to verify feeds conformity to quality by analysing commercial feeds and fodders at purchasing. This would introduce more systematic quality assurance at the farm level. Results of quality and conformity to standards of feeds supplied to dairy societies and farmers organizations can be shared on an IT platform established by the farmer federation or apex organization. This activity is of public nature and can be funded under existing donor development funds.

8.7 Building raw material supply chain efficiencies

There is great need for Kenya to be self-sufficient in animal feed ingredient supply. The current scenario where more than 70% of ingredients are by-product based and imported from neighbouring countries and India is not sustainable. The imports risk breakdowns in supply depending on several factors including drought, change in policies of the exporting countries, high transportation costs and quality control challenges. Policy should therefore provide a conducive environment and incentives for increased investments in production of oilseed and energy crops including soybean, sunflower, cottonseed, maize, sorghum, oats and barley. Development programs and financial institutes should facilitate asset financing, off-take and contract farming agreements and make strong linkages to the animal feed manufacturers. The feed manufacturers should also be pro-active in contracting farmers to produce raw materials for manufactured feeds. In addition they should also explore possibilities to establish value chains and business models for commercial fodder production to single source feeds and by-products from agro processing industries. There should be a strong linkage between grain producers and the feed industry similar to the Zimbabwe Agricultural Marketing Authority (ZAMA). The formation of such an association enables information on industry needs, raw material availability and safe storage.

8.8 Feed manufacturers insurance

Currently, there is no legal requirement for manufactures to possess liability insurance as in other countries. The industry regulatory framework should make feed manufacturers insurance a requirement that is verified at obtaining feed manufacturing operational permit.

9. REFERENCES

1. Aldington, J. (1970). Animal feeds industry in Kenya: preliminary survey. Institute of Development Studies. University of Nairobi, Nairobi, Kenya.
2. Argwings-Kodhek (JAAR) Contemporary Issues Determining the Future of Kenyan Agriculture - An Agenda for Policy and Research, Policy Brief, TEGEMEO Institute: Nairobi, Kenya.
3. Argwings-Kodhek, G. (2005). Background Document on Umbrella Legislation for Kenyan Agriculture. Tegemeo, Institute of Agriculture Policy and Development. Nairobi, Kenya.
4. Centre for Governance and Development. (2005). Anatomy of Agriculture Sub-Sectors., Nairobi Kenya.
5. FAO (Food and Agriculture Organization of the United Nations). (1993). Kenya Dairy Development Project, Preparation Report. Report 34/93 CPKEN 33. FAO, Rome, Italy.
6. G.O.K. (2008). National Livestock Policy. Ministry of Livestock Development, Nairobi, Kenya.
7. G.O.K. (2010). Draft National Urban and Peri-Urban Agriculture and Livestock Policy. Ministry of Livestock Development, Nairobi, Kenya.
8. G.O.K. (2010). Agricultural Sector Development Strategy 2010–2020. Ministry of Agriculture, Nairobi, Kenya.
9. G.O.K. (2010). Kenya National Dairy Master Plan Volume I: A Situational Analysis of the Dairy Sub-sector. Ministry of Livestock Development, Nairobi, Kenya.
10. G.O.K. (2010). Kenya National Dairy Master Plan Volume II: Action Plan and Implementation Strategy. Ministry of Livestock Development, Nairobi.
11. GFSI, G. F. (2011). Enhancing Food Safety Through Third Party Certification.
12. <http://www.fundsforngos.org/volunteer-opportunity/volunteer-opportunity-with-winrock-in-kenya/> (Accessed: 11/10/2012)
13. Kang'ethe, E.K.& Langat, K.A. (2009). Aflatoxin B1 and M1 contamination of animal feeds and milk from urban centres in Kenya. *African Health Sciences* 9 (4): 218-226.
14. Land O'Lakes, (2011). Capacity Building for the Kenya Association of Feed Manufacturers, USAID Kenya Dairy Sector Competitive Program– 623-00-08-0020-20.
15. Makun, H.A., Anjorin S. T., Moronfoye, B. Adejo, F.O., Afolabi, O., Fagbayibo, A., Balogun, G.B.O. & Surajudeen, A A. (2010). Fungal and aflatoxin contamination of some human food commodities in Nigeria. *African Journal of Food Science* Vol. 4(4): 127-135.
16. Masai, W., Mbithi, M. & Mwangi, J. (2005). The fisheries subsector: Nature of Legislation practices, administrative weakness, threats and the way forward. Paper presented at the agricultural sub-sectors reform peer review forum on Jan 31st, 2005, Nairobi Safari Club.
17. Muriuki, H., Omore, A., Hooton, N., Waithaka, M., Ouma, R., Staal, S. & Odhiambo, P. (2003). The Policy environment in the Kenya dairy sub-sector: A review SDP Research and Development Report No.2 Smallholder Dairy (R& D) Project.
18. Nyandat, B. (2007). Analysis of feeds and fertilizers for sustainable aquaculture development in Kenya. Fisheries Technical Paper No.497. Rome, FAO. pp. 423–436.
19. Nyariki, D.M. (2009). Impacts of policy reforms on the livestock industry in Kenya: The case of the dairy sector. *Livestock Research for Rural Development* 21 (10).
20. Oloo, J. (2010). Food Safety and Quality Management in Kenya: An Overview of the Roles Played by Various Stakeholders. *African Journal of Food Agriculture Nutrition and Development*, 10(11): 4379-4397.
21. Omiti, J. (2001). Impacts of liberalization in Kenya dairy sector. http://www.ilri.cgiar.org/InfoServ/Webpub/fulldocs/South_South/theme4_4.htm
22. Omore, A., Muriuki, H., Kenyanjui, M., Owango, M. & Staal, S. (1999). The Kenyan Dairy Sub-Sector: A Rapid Appraisal. Smallholder Dairy Research & Development Project Report.
23. Pinotti, L. & Dell'Orto, V. (2011). Feed safety in the feed supply chain. *Biotechnologie, Agronomie, Société et Environnement*, 15.

24. Said, N. & Mbugua, P. (2005). Present Situation of Compounded Feeds in Kenya and Perspectives for Better Use of Local Feed Resources.
25. Sheila, A.O. & Margaret, A.K. (2012). Market Samples as a Source of Chronic Aflatoxin Exposure in Kenya. *African Journal of Health Sciences, Volume 20, Number 1-2 January-March 2012.*
26. Speedy, W. (2001). The global livestock revolution: opportunities and constraints for the feed and livestock industries. Compound Livestock Feed Manufacturers Association of India, 43rd National Symposium, September 2001.
27. The Laws of Kenya Report. *Animal Disease Control Act, Cap. 364.*
28. The Laws of Kenya Report. *Customs and Excise Act, Cap. 472.*
29. The Laws of Kenya Report. *Fertilizers and Animal foodstuff Act, Cap. 345.*
30. The Laws of Kenya Report. *Plant Protection Act Cap.324.*
31. The Laws of Kenya Report. *Public Health Act, Cap.242.*
32. The Laws of Kenya Report. *Standards Act, Cap 496.*
33. The Laws of Kenya Report. *Weight and Measures Act Cap.513.*
34. USAID (2011). Technical Report: Regulatory Environment for Animal Feeds in Zambia, Malawi, Mozambique, Zimbabwe, Namibia and Botswana. USAID Southern Africa.

APPENDICES

Suggested AKEFEMA Secretariat Organizational Chart

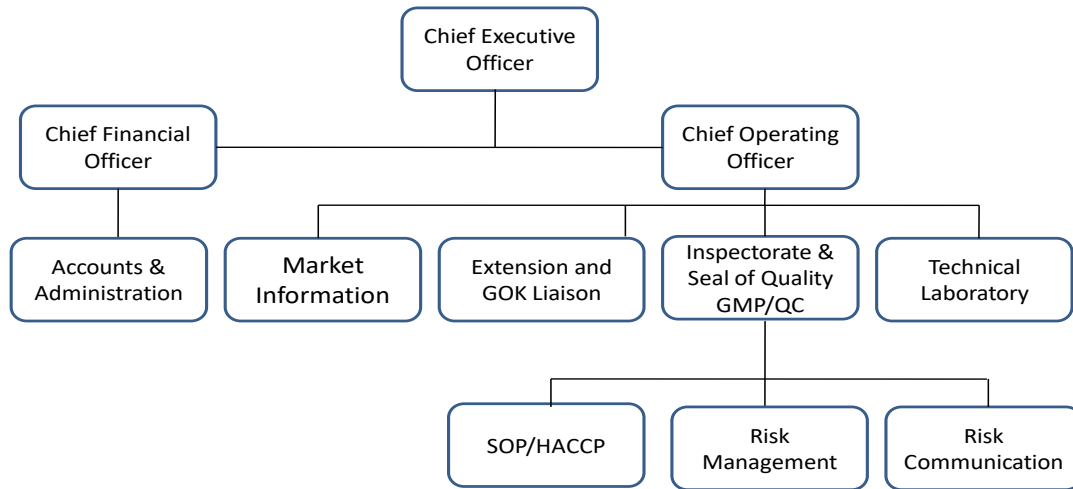

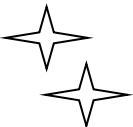

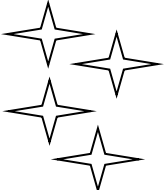
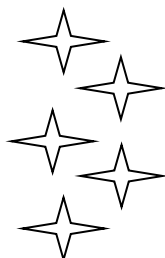


Figure 4. Suggested Organization Chart for AKEFEMA Secretariat.

Table 6. Criteria for the five Star rating.

<p>One star</p> 	<ul style="list-style-type: none"> ❖ An operating feed mill for over one year ❖ AKEFEMA member ❖ Basic measurement tools, scales, thermometer, sieves-that are calibrated ❖ Labelled products in the market ❖ Proper sanitation and hygiene standards ❖ Batched products that are traceable to formulation ❖ Products that meet KEBS specification ❖ Have a standardization mark of the respective feed being produced ❖ In house or contracted Animal Nutritionist
<p>Two Star</p> 	<ul style="list-style-type: none"> ❖ Results of in house or contracted testing of finished products ❖ Separate /demarcated raw material /finished product warehouse ❖ A clean mill with documented cleaning and maintenance procedure ❖ Has reference materials /samples ❖ An official documented sampling plan followed
<p>Three Star</p> 	<ul style="list-style-type: none"> ❖ Has a production plan ❖ Has a preventive maintenance schedule ❖ Records on internal audits done ❖ Available records on staff training ❖ Available records on Lab testing indicating compliance for a 3-month period
<p>Four Star</p> 	<ul style="list-style-type: none"> ❖ Has test results (conforming) from in house/subcontracted laboratory for six months minimum ❖ HACCP/GMP practices in progress ❖ Has a in-house nutritionist ❖ Has the following documentation: <ul style="list-style-type: none"> ○ Working procedures ○ Quality manual ○ Quality policy ❖ HACCP Plan where applicable ❖ Quality culture demonstrated
<p>Five Star</p> 	<ul style="list-style-type: none"> ❖ Certified to HACCP ❖ Certified to ISO 9000 ❖ Environmental requirements approved by NEMA ❖ Management of solid and liquid waste ❖ Fully compliant to KEBS requirements ❖ Diverse products ❖ Complaint handling procedures ❖ Minimum complaints from customers ❖ Corporate social responsibility policy in application ❖ Potential technology Improvements ❖ Local reference mill for training

(Source: Land O'Lakes, 2011)

Table 7. Revenue and expenses projections.

Year/ Quarter	2009	2010 (target subscription by 60 members)	2011 (target subscription by 70 members)	2012 (target subscription by 90 members)
AKEFEMA 2009-2012 Revenue Generation Plan				
Revenues from Membership Subscriptions	KES 430,000	KES 600,000	KES 700,000	KES 900,000
Other Sources				
Grants to train members on basic feed manufacturing concepts (GMPs, HACCPs, & Least cost formulation)		KES 3,500,000		
Sale of AKEFEMA corporate clothing (Shirts, T-shirts, Caps , Pullovers)		KES 30,000	KES 60,000	
Workshop on code of conduct and feed certification protocol (2 days) target 70 members @ KES 20,000			KES 1,400,000	
Grand to carry out Feed certification audit (target 70 members @ KES 50,000			KES 3,500,000	
Poultry symposium and exhibition by stakeholders target 50 Local companies @ KES 20,000			KES 1,000,000	
AKEFEMA News magazine-15 adverts @ KES 50,000 and 2000 copies @ KES 100			KES 770,000	
Code of conduct audit target 70 members @ 10,000				KES 700,000
Commission from members for AKEFEMA to facilitate raw material contract farming –target 90 @5,000				KES 450,000
Organize feed and food congress for Eastern and Southern African countries-target 50 foreign companies@ \$ 500 and 100 Kenyan companies @ KES 20,000				KES 3,875,000
Expenses				
Salaries				
Programs Officer	KES420,000	KES 420,000	KES 462,000	KES 508,200
Membership Development and welfare officer		KES 240,000	KES 462,000	KES 290,400
Technical officer		KES 240,000	KES 264,000	KES 290,400
Communication and Advocacy officer		KES 240,000	KES 264,000	KES 290,400
Intern		KES 120,000	KES 132,000	KES 145,200
Field expenses		KES 78,000	KES 85,800	KES 98,380
Motor vehicle expenses	-	-	KES 480,000	KES 504,000
Rent	-	-	KES 144,000	KES 18,000
Insurance and licences	KES 7,653	KES 7,653	KES 7,653	KES 7,653
Electricity and water	-	-	KES 60,000	KES 72,000
Telephone		KES 36,000	KES 39,600	KES 34,560

Travel and subsistence		KES 168,000	KES 184,800	KES 203 080
Communication costs		KES 78,000	KES 85,800	KES 94,380
Printing stationery and documentation		KES 360,600	KES 402,600	KES 479, 160
Advertising/PR and networking		KES 200,000	KES 350,000	KES 420,000
Computer expenses		KES 77,800	KES 78,800	KES 82,600
Audit and accountancy		KES 12,000	KES 15,000	KES 18,000
Provisions for bad debt N/A				
Miscellaneous office expenses		KES 240,000	KES 264,000	KES 290,400
Bank charges		KES 1,200	KES 1,500	KES 1,800
Depreciation		KES 79,097	KES 79,097	KES 79,097

Source, AKEFEMA strategic plan 2012