Mapping animal feed manufacturers and ingredient suppliers in Kenya

This work has been made possible by support from the Department for International Development (DFID)
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Mapping animal feed manufacturers and ingredient suppliers in Kenya

October 2017
Why the study matters

The study sought to map animal feed manufacturers and suppliers of the feeds’ raw materials in Kenya and establish factors that affect feed in terms of cost, quality and what limits their effective use at farm level.

THIS REPORT

• Maps the feeds industry structure, nature, players, and challenges in Kenya
• Establishes annual potential demand, supply, and growth of concentrate feed
• Explores systemic opportunities and constraints that will improve supply of feeds for more effective use by livestock farmers

WHEN AND WHERE WAS THE STUDY CONDUCTED?

The study was carried out between August and October 2016, by a team from Right Track Africa (RTA) and Nutrimix Limited.

The study used data collected from feed manufacturers, raw material suppliers, farmers and key informants along routes, regions and towns where intensive feed manufacturing is expected to take place.

This included Nairobi city and its environs, central Kenya and upper Eastern, Rift Valley, Western, Nyanza, lower Eastern and Coastal.

Key Intervention Areas

In summary, the study observes that the Kenyan animal feed business is a vibrant industry characterized by a rapid entry of various operators as manufacturers (milling and mixing) and ingredient suppliers.

HOW TO MEET DEMAND IN THE FEEDS INDUSTRY:

1. Create an enabling environment for investors in raw material supplies and feed manufacturing. This entails ease of registration to operate, easy access to credit and other support services, and access to suppliers and buyers.

2. Stakeholders should review ways of how best to obtain feed operators information (population, location, capacity), either by national and compulsory census or derivation of such information during registration and renewal of licences with KEBS and AKEFEMA.
3. There is need for an improved or more effective regulation and monitoring of the activities of all actors dealing with livestock feed – as suppliers, manufacturers and their evolution from one form to the other.

4. Supported production of local milling and mixing machinery through transfer of knowledge and skills.

5. Support research, development and policy for local production of raw materials for feed manufacturing.

6. Operators should explore ways of procuring and delivering raw materials at lower costs. This includes crowd sourcing (for example by groups of farmers and retailers) to achieve the economies of scales used by the large scale operators but only if group dynamics (mobilization and trust) can be managed to support effective participation.

TO IMPROVE QUALITY:

1. There is need for intensive education and information sharing. The areas of interest will be about feed quality of available feeds and ingredients and how they could affect animal production and productivity.

2. There is need to establish chemical and nutritional analysis services that can serve all users – suppliers, manufacturers and farmers. These services should both be accessible and affordable.

3. The regulators should set up a system to closely monitor the whole supply chain and ensure all is in line with required standards. Options for enhancing regulation capacity include outsourcing such activities to accredited providers.

4. Feed analysis and assurance service providers should continually upgrade their analytical facilities, ensuring they are up to date and providing reliable results.

5. Completion and passing of the Animal Feedstuff Bill (2016) and the enforcement of standardization through the registration of all feed operators with KEBS and standardization of all feed products brought into the market.

6. There is need to review requirements for members to be registered with KEBS and AKEFEMA to make it easier (in charges and competency) for easier enrolment, quality regulation and monitoring.

7. There should be intensive education and information sharing on proper storage, stock management transporting and handling of feed stuff. This includes effective pest management.
TO MAKE FEEDS AFFORDABLE:

1. Dealers should strive to utilize shorter supply chains that deliver products either directly to retail points or farmers. Examples of delivering in bulk for reconstitution or re-packaging at retail and consumer points should be explored further.

2. Operators should intervene to reduce long term overhead costs and the variable costs of electricity and transport. For retailers pooling warehousing space with fellow operators may be explored.

Key findings and recommendations from the study:

Finding 1: Feed producers concentrated in Nairobi and Central Kenya

- Feed producers and raw material suppliers are concentrated in and around Nairobi city, its environs and the central regions of the country, possibly following commercial dairy and poultry populations as well as the availability of industrial infrastructure, roads, water and electric power.
The concentration of feed producers and raw material suppliers in and around urban areas affects availability resulting in high transportation costs and high sale prices of the products in rural areas. This could also be the reason for the proliferation of many small/medium millers to fill the gap.

**RECOMMENDATIONS**

Enhance ease of doing business by encouraging entry of investors in underserved regions by

- a. Easing registration to operate
- b. Providing access to credit and other support services
- c. Connecting suppliers and buyers

**Finding 2: Entry of many unregulated actors, lead to poor quality**

High population of agents without oversight of regulators leads to production of low quality feeds.
HOW THE FEED PRODUCERS EVOLVE

• Most animal feed manufacturers begin as agents of raw materials for manufacturers and other supply chain actors.

• As the business grows the agents acquire warehousing space for better stock management and market expansion.

• The agent then acquires weighing machines and mixers, at which time they venture into mixing ingredients, first for individual and specified customer requests, then gradually for sale in the open market using borrowed or their own brand labels.

RECOMMENDATIONS

• Need for effective regulation of the activities of all actors dealing with livestock feed and monitoring actors as they evolve from one form to the other.

• Establish an information system that easily and quickly reveals the location of all the feed operators (sort of dynamic and regularly updated map) to enhance access by all supply chain agents. This can also be used to identify investment opportunities when such maps reveal exploitable gaps.

Finding 3: No permanent address, no exact statistics

Exact population of animal feed producers could not be established—they did not have fixed physical addresses.

This could be the reason for the proliferation of many small/medium millers to fill the gap.

The skewed distribution affects availability leading to high transportation costs of feeds to far flung areas.

RECOMMENDATIONS

Stakeholders should review ways of how best to obtain feed operators information, either by national and compulsory census or derivation of such information during registration and renewal of licences with KEBS and AKEFEMA. This will require approaches to ensure all members register and are willing to provide that information, possibly through registration.
Finding 4: Majority of manufacturers own or outsource equipment

Proportional ownership of key feed manufacturing machineries

Majority of manufacturers had a mixer and those who did not outsourced from neighbouring or friendly fellow operators.

Imported machinery, most of which comes from Europe (Britain, German, etc.) and Asia (India and China) costs much more than the local fabrications. Service back-up for machines from Asia is relatively inadequate, possibly resulting in high maintenance costs.

The acquisition and use of local fabrication of machinery and equipment is an active industrial model in Kenya that provides equipment that is relatively more affordable than those imported.

RECOMMENDATIONS

The improvement of the local equipment could be supported using the Jikokoa approach where local and international manufacturer team up for joint production and sales.
Finding 5: Majority of animal feed manufacturers are small scale

Over 90% of manufacturers are small scale operators producing less than 1000 tonnes per month. Only a few produce higher volumes (7% producing 1000 – 5000 tonnes/month, and 2 – 3% producing higher than that).

Those producing the bulk of the high feed volumes are based in Nairobi and neighboring counties.

Finding 6: Working below capacity: Production vs installed capacity

Kenyan feed manufacturers operate below optimum levels meaning the installed production capacity is adequate to meet the country’s demand.

The potential annual production of the country is about 1,126,656 tonnes, and the manufacturers are only able to utilize two thirds (69%) of it.
FEED MANUFACTURERS’ INSTALLED CAPACITY ESTABLISHED BY THE STUDY

<table>
<thead>
<tr>
<th>Capacity parameter</th>
<th>Statistic</th>
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<tbody>
<tr>
<td>Number responding on capacity data</td>
<td>165</td>
</tr>
<tr>
<td>Number of those with &lt; 1000 tonnes/month capacity</td>
<td>140 (84% of respondents)</td>
</tr>
<tr>
<td>- Average potential production capacity</td>
<td>518 tonnes/month</td>
</tr>
<tr>
<td>Number of those producing 1001 - 4,000 tonnes/month capacity</td>
<td>23 (14% of respondents)</td>
</tr>
<tr>
<td>- Average potential production capacity</td>
<td>2,133 tonnes/month</td>
</tr>
<tr>
<td>Total estimated current production capacity of the 209 companies</td>
<td>64,486 tonnes/month</td>
</tr>
<tr>
<td>Total estimated potential production capacity</td>
<td>93,888 tonnes/month</td>
</tr>
<tr>
<td>Average utilization of installed capacity (all companies)</td>
<td>68.9%</td>
</tr>
</tbody>
</table>

RECOMMENDATIONS

1. Investors should conduct feasibility studies to inform them of production capacity. They should also consider establishing production capacity in increasing stages that can be adequately developed for utilization when there is sustained demand for it.

2. Government should collect capacity data as part of the census and monitoring. The information would help advise stakeholders on how best to utilize the feed production capacity that is available.

3. Supported improvement in local feed milling and mixing machinery through transfer of knowledge and skills that will improve the resulting product’s production, efficiency and effectiveness.

4. Regulation stakeholders (government through KEBS, industrial associations and their members) to track innovation in products and services to ensure they adhere to minimum standards and allowed and un-biased practices.
Finding 7: Manufacturers’ priority: Poultry and Dairy feeds

Poultry feed forms the largest proportion of the products manufactured (41%) followed closely by dairy feeds (39%).

The other feeds (4% of the total) include feeds for dogs, mice, rabbits, fish, horses, turkeys, as well as vitamin and mineral preparations and food microbes. There was also mention of a ‘Survival mash’ for Turkana cattle, and feeds for turkeys and goats.

Those producing the bulk of the high feed volumes are based in Nairobi and neighboring counties, as shown in Figure below:

Geographical distribution of feed production volumes

Due to stiff competition, many manufacturers have become innovative by supplying unique products for niche markets.

Many investors have gone into feed milling and mixing business using basic and easily installed infrastructure – a hammer mill and mixer – with the sizes varying depending on target market and volumes.

The table below shows some of the innovations by operators seeking to expand their markets or penetrate into new ones.
### EXAMPLES OF PRODUCT AND SERVICE INNOVATION AND DIFFERENTIATION

<table>
<thead>
<tr>
<th>Innovation &amp; niche types</th>
<th>Details observed</th>
</tr>
</thead>
</table>
| **Products and branding** | 1. *Specially formulated compositions* that deliver richer nutrient mixes or meet specific nutritional requirements than the standard products. These preparations were given special brands by the innovating operators.  
**Examples:**  
» Unga Farmcare’s Layers Special, and FastGro for layers and broilers respectively. Maxi-Milk for dairy cattle. Mineral Licks for specific physiological periods of the cow, e.g. “Dry Cow Meal”.  
| **Markets** | 2. *New feed products for un-explored users*  
**Examples:**  
» Kienyeji Mash for indigenous chicken (by Sigma) whose demand and production is fast growing  
» Specially formulated feeds for various function poultry flocks, e.g. breeder birds  
» Sigma Fish Pellets for developing fish pond farming and pellets for supplementing camels |
| **Services** | 3. *Requested feed formulations* (mixing, packaging and even delivery) for individual farmers’ requests, e.g. by Chwichwi in Thika  
4. *Training of farmers on the utilization of the product offerings*. Some companies, e.g. Unga and Nakumodern in Nakuru have fully fledged extension services.  
5. *Partnering with processors and dairy cooperative societies* who operate consumer shops for members |
Finding 8: Maize and Wheat products- the market leaders

Feed manufacturers in Kenya largely rely on by-products from food agro-processing industries mainly sourced from neighbouring countries in the East Africa Community or imported from India and other international markets.

The study established that maize, wheat and their products are the most dominant. Some raw materials like vitamins, mineral premixes and amino acids are not available locally hence imported.

Average proportion of feed ingredients imported and purchased

Sources of some of the imported raw materials
Finding 9: What drives supply, demand and trends?

Drivers of Supply and Demand

1. Changing farming practices increasing ingredient demand
   - More than 50% of sales (or demanded volumes) at the retail points was a combination of compounded feeds and raw materials
   - 16% of retailers either exclusively sold ingredients or more ingredients than compounded feeds, showing a gradual shift to on-farm formulation

2. Competition causing ingredient scarcity

3. Climatic conditions
   - Maize and wheat (and their bran and germ by-products) constitute a bulk of the ingredients used in livestock feeds but their availability varies during the year depending on the crop’s production (and harvest) cycles and productivity

4. Government regulations varying availability
   - The Government of Kenya (GoK) restricts the importation of some of raw materials, especially those that are linked to genetic modification

WHY THE CHANGE IN FARMING TRENDS?

Due to the high feed costs, farmers are increasingly looking for ways of developing home-made rations for their livestock using ingredients purchased from retail points.

The on-farm feed formulations is supported by what farmers reported as a better understanding of livestock nutrition requirements and feed mixing process and (increased) access to feed formulation information.

THE IMPACT OF COMPETITION

The livestock feed industry continues to attract many new entrepreneurial entrants and at all investment levels. This growth has resulted in the scarcity of raw materials due to increase in demand, and the uncertainty of quality because the regulation systems are not able to cope with the larger numbers of operators in direct contact with the farmers.

There are also allegations of fake products by unscrupulous business entities taking advantage of the high demand and insufficient enforcement capacity.
HOW GOVERNMENT REGULATIONS AFFECT AVAILABILITY OF FEED INGREDIENTS

Currently, GoK does not allow importation of some yellow maize from countries such as USA due to restrictions by the Biosafety Act. As a result humans and animals compete for the available maize grain affecting availability.

Other Government regulations that affect supply of animal feeds are restricted importation of materials that require special clearance (e.g. Bone Meal), those related to taxation (e.g. VAT Act) as well as those related to environmental conservation, such as restriction of fishing to allow breeding at certain times of the year reducing the supply of omena (dagaa fish).

RECOMMENDATIONS

1. Stakeholders should review import restrictions for products that will be easier and more affordable to bring from outside the country.
2. Support research into alternatives of materials that can be used to provide same nutrient inputs as the imported raw materials.
3. Support establishment of accessible and affordable analysis services that can serve all users – suppliers, manufacturers and farmers.
4. Make it mandatory for suppliers to analyse ingredients before sales.
5. Arrange for collective procurement processes and nutritional analysis for strategic sharing and reduction of such costs.

Finding 10: Mechanisms manufacturers employ to assure feed quality

Technical capacity required for managing feed quality

Feed formulation specialist: Directly in charge of final feed composition and constitution, ensuring that correct ingredient proportions are used in delivering the required nutritional composition.

Quality assurance staff: In charge of the laboratory systems and the analysis that will be done as well. They are in charge of the laboratory systems and what kind of analysis will be done on all ingredients and feeds and interprets the results.

Professional training in feed milling is offered at a vocational level, with some organizations being able to send their staff to advanced courses overseas. Quality is assured when manufacturers have easy access to feed analysis labs or services to check and confirm the nutrition content of ingredients before compounding the feed and of the final products after their constitution.
WHERE TO WATCH OUT: IMPROVE SKILLS ON FORMULATION, MILLING AND MIXING

Out of the 74 surveyed manufacturers who responded 26% of those did not have resident feed formulation specialists, 53% did not have a resident miller and 22% did not have a quality assurance specialist. Of the 47% of the manufacturers with a resident miller 59% of them had acquired university and 15% had college education (Figure 9). Almost half (45%) of the owners/directors had relevant background and technical training, in fields such as animal health, animal production, animal nutrition, animal science, and veterinary medicine.

INDICATORS OF TECHNICAL COMPETENCIES AS REPORTED BY MANUFACTURERS

Due to the high cost involved in feed milling training, over half of companies (53%) do not have such staff and the few present either had university degrees or college certificates. Most manufactures had a resident quality assurance personnel (79%) and, with the majority having a university level education (40%).

More than half (54%) of the manufacturers without in-house feed formulation specialists (n=26), obtained those services from consultants, 15% from commercial laboratories and 4% from research academic labs and just developed their own formulation.
Finding 11: What ails the industry: inadequate feed nutrition analysis

Only 28% of the feed manufacturers reported that they had their own feed analysis facilities (within their plants). The remaining number outsourced the services from various providers – commercial, research and academic labs, KEBS and private consultants (at 41%, 41%, 4% and 1%, respectively). These are nutrition analysis service providers who have gone through the KEBS certification program and whose results are accepted.

The various analytical service support providers

The 3% who take samples to KEBS for analysis are those who are close to the institution and the KEBS lab is only in Nairobi.

Factors that constrain access to and use of feed analyses services include, costs, unreliability of results and inadequate engagement with user clients.

On costs, one participant said: “It is expensive to analyze; one sample test on average costs KES 4000”.

The unreliability of results was observed from inconsistency in reports: “Samples from the feed batches give different results …” Some providers had “Outdated machines … which sometimes break down, … or can only do certain tests”.

“KEBS staff (while taking samples) mainly want to harass (rather than) educate the manufacturers”).
Extent to which feed operators have assurance policy and are registered with KEBS

Unregistered feed operators and ingredient suppliers are difficult to trace, and therefore possibly unregulated by KEBS. These low registration rates by those suppliers implied that buyers (especially manufacturers) have to incur expenses in testing and ascertaining the quality of acquired ingredients. These costs are included in the cost of production and passed down the supply chains.

Registration with KEBS allows members to apply for standardization marks for specific feed products. The KEBS Standardization Mark (S Mark) is a mandatory product certification scheme for locally manufactured products provided for under section 10 of the Standards Act Cap 496, Laws of Kenya. Despite their widespread registration, not all manufacturers had successfully acquired an S Mark for all their products.

Status on quality assurance certification in the feeds industry

The uncertainty of raw material quality means those using the ingredients directly for feed mixing, especially in on-farm ration formulation, are exposed to risks of poor quality formulation and contamination.

Despite the observed high internal technical competence with manufacturers, low rates of conformity to KEBS quality standards have been reported.

This means the industry has skilled personnel but this is not translating to
adherence to expected standards. The major constraint is cost of compliance.

**RECOMMENDATIONS**

- There is need for intensive education and information sharing on how to produce and supply feed of acceptable quality.
- Make available to all actors, a database of all possible sources of skills and services.
- There is need for various labs to upgrade and constantly ensure their analytical facilities are up to date and providing reliable results.
- KEBS should consider outsourcing services from accredited labs to meet the demand.
- The government should ensure the registration of all feed operators with KEBS and standardization of all feed products brought into the market.
- Consumers, and especially retailers and farmers should demand for quality assurance of all feedstuff supplied to them commercially by manufacturers and dealers in ingredients.

**Finding 12: Policies and regulations governing feed industry**

The country’s key legislations are the Fertilizer and Animal Foodstuff Act Cap 345 (1967), the Standards Act Cap 496 and the Animal Disease Act Cap 364. The enforcing agents are the State Department of Livestock (and particularly the Directorates of Veterinary Services and Livestock Resources) and the Kenya Bureau of Standards (KEBS). The Kenya Plant Health Inspectorate Services (KEPHIS) phytosanitary regulates the importation of agricultural products, some of which used as ingredients in feed processing. Laboratory testing of feeds falls under KEBS.
CHALLENGES

Even though the KEBS legal framework for regulation is strong, there seems to be a challenge with its enforcement capacity.

1. The cost of KEBS registration and membership was considered to be “extremely high” as reported by some of the small manufacturers.

2. It was reported that “KEBS (took) time to visit the premise for inspection – even after paying and reminding them”.

3. Lack of apparent value from registration with KEBS. There were testimonies “There is lack of enforcement; you can easily survive without registering. There is no strict control on black markets selling cheap products”.

THE FINANCE BILL AND VAT EXEMPTION

Every financial year the Government produces the national budget which is then operationalized through the Finance Bill, later accented into the Finance Act. The Bill contains all taxes and tax exemptions for that financial year. The VAT Act 2012 and the subsequent amendment in 2013 resulted in compounded feeds being VAT-exempted.

SECTOR ASSOCIATIONS, MEMBERSHIP, BENEFITS AND CHALLENGES

The most relevant and dominant association for this sector is the Association of Kenya Feed Manufacturers which was initiated in 2003.

BENEFITS ACHIEVED BY MEMBERS THROUGH AKEFEMA

1. **Price regulation and bargains**
   a. Price controls through stakeholders agreements

2. **Lobbying and advocacy:**
   a. Lobbying/advocating on behalf of feed millers e.g. VAT tax exemption
   b. Regulating quality of raw materials and negotiating for subsidies
   c. Influencing the government standards like KEBS - AKIFEMA sits in the KEBS board

3. **Knowledge platform**
   a. Sharing (or acquiring) knowledge on new technologies, new quality standards
4. Networking platform  
   a. Provides networking opportunities among members and marketing of produce through trade shows  

5. Access to finance  
   a. Financial support  
   b. Helps (through the government) in acquiring equipment  

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**Reasons given for reluctance or delays in registering with AKEFEMA**

1. **Lack of awareness**  
   a. Especially the small and new entrants (manufacturers) who do not know about AKEFEMA. “AKEFEMA do not visit members on the ground to sell/advertise the organization to them”.  
2. **High registration and membership costs**  
   a. Some respondents found the subscription fees to be high; “The annual subscription KES 60,000 as the main hindrance”.  
3. **Unfair/unbalanced representation for the different scales of production**  
   a. For the smaller millers the Association requirements were a challenge. They felt as though “they are not governed by the same code of conduct”.  
   b. (The agenda for) meetings tend to “favor big manufacturers in the industry”. Some members feel they do not belong. “Kizungu mingi and complicated topics of discussions”.  
   c. “AKEFEMA newsletter tends to advertise for competition; they do not give equal chances for all members to get advertised”.  
   d. The association needs to be decentralized; not be stationed in Nairobi alone  
4. **Unclear or delayed benefits**  
   a. “I subscribed for one year but I did not see any benefits so I have not subscribed for two consecutive years”. “There is nothing we are getting from AKEFEMA apart from contributing and waiting for the year to end so as we can contribute again. Previously we used to benefit a lot but the way it is currently constituted (especially the leadership) we are not benefitting”.  
   b. “AKEFEMA does not take interest of (all) manufacturers seriously”.  
   c. “AKEFEMA has failed to (remove quacks from the market and ensure there is fair competition) thus manufacturers does not see the need to join it”. “There are too many unregistered competitors and AKEFEMA is doing nothing about it”.  

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**RECOMMENDATIONS**

1. KEBS has publicized its services public but the concerns on limited awareness means that the institution should consider re-boosting public knowledge on the institution’s role.  
2. Completion and passing of the Animal Feedstuff Bill (2016).  
   a. There is need for the various institutions in the industry to recognize their complementary roles and work together in policy review.  
   b. The stakeholders should work through a shared platform where all interested parties share concerns and work out a harmonious approach to acceptable Amendments.  
3. A review of requirements for members to be registered with KEBS and AKEFEMA to make it easier (in charges and competency) for easier
enrolment, quality regulation and monitoring

4. The adoption of a cordial approach in engaging and recruiting feed operators for membership and adherence to regulation policies and regulations. This will entail:

   a. An education and awareness of the importance and value (benefits) of such registration with KEBS and AKEFEMA.

   b. An amicable recruitment process that supports registration and adherence, including mutually acceptable processes and monitoring for regular improvement.

   c. A recommendation was made during the study’s validation workshop that AKEFEMA can establish and promote its own mark of quality, alongside the one of KEBS.

Finding 13: The pain of transporting and storing animal feeds

Feed ingredients and compounded feeds are nutrient-rich and highly moisture-absorbent beans, cakes, mashes, pellets and crumbs, whose quality easily deteriorates from environmental conditions and pest attack. They are also bulky and require well organized transport and storage for effective procurement, delivery, and utilization.

Storage challenges were more widespread with about 20% of all operators reporting between moderate and serious levels of challenge.
Transport and storage challenges

1. Manufacturing and preparation practices
Some respondents reported that feed operators (manufacturers and suppliers) were not using or supplying clean, high quality feed that is free from contamination.

2. Storage and transportation facilities and practices
Poorly designed vehicles were reported to affect feed quality.

3. Stock management
Poor stock management was a problem when supply chain actors overstocked resulting in “expiry or overstay of feeds in the (supplying) store”.

4. Product interference along the supply chain
Some retailers were reportedly mixing feeds on their own (with other concentrates) to increase profits.

Factors related to transport challenges

<table>
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<tr>
<th></th>
<th>Manufacturers</th>
<th>Manufacturers/Suppliers</th>
<th>Suppliers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roads</td>
<td>95%</td>
<td>81%</td>
<td>50%</td>
</tr>
<tr>
<td>Weather</td>
<td>64%</td>
<td>58%</td>
<td>40%</td>
</tr>
<tr>
<td>Govt Regs</td>
<td>57%</td>
<td>52%</td>
<td>35%</td>
</tr>
<tr>
<td>Own transport</td>
<td>45%</td>
<td>45%</td>
<td>25%</td>
</tr>
<tr>
<td>Transport type</td>
<td>14%</td>
<td>32%</td>
<td>5%</td>
</tr>
<tr>
<td>Other</td>
<td>12%</td>
<td>23%</td>
<td>5%</td>
</tr>
</tbody>
</table>

RECOMMENDATIONS

The factors affecting the quality of feed when in supply chain give guidance to recommendations on how best to improve their quality:

1. Proper storage
   a. All supply chain agents and farmers should construct and use storage facilities (buildings and shelving or pallets) that minimise exposure of feed to moisture, sunlight and pests.
   b. Feed should be kept and transported in containers (including bags) that are water-proof and not easily damaged during handling.
   c. Transportation and storage personnel and activities should ensure the containers remain intact and, in case of any damage, the feed should immediately be transferred to other containers.
   d. At retail points and farms, any open feed sack should be “closed”/covered at all times.

2. Strategic stocking
   Retailers and farmers should arrange to buying or use a continuous flow of feeds that avoids expiry.

3. Pest management
   Pest elimination from storage and transportation while ensuring the
feeds are not contaminated.

4. Monitoring to prevent adulteration, reconstitution and re-packaging
   This can only best be done by government regulation agents and feed manufacturers applying a collaborative approach to set up systems of following up and stopping any related practices at retail points.

Finding 14: From source to consumers

<table>
<thead>
<tr>
<th>Supply Chain Model</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Source + Distributor + Wholesaler + Retailer + Consumer</td>
<td>37.1%</td>
</tr>
<tr>
<td>Source + Distributor + Retailer + Consumer</td>
<td>37.1%</td>
</tr>
<tr>
<td>Source + Distributor + Other + Wholesaler + Retailer + Consumer</td>
<td>11.4%</td>
</tr>
<tr>
<td>Source + Distributor + Consumer</td>
<td>8.6%</td>
</tr>
<tr>
<td>Source + Consumer</td>
<td>5.7%</td>
</tr>
</tbody>
</table>

Source: Kenya Markets Trust 2017
Graphic: Michael Mosota

RECOMMENDATIONS

1. There is need to use shorter supply chains that deliver products either directly to retail points or farmers.

2. Review the supply chain models to incorporate bulk transportation for packaging at retail points or farms.

3. There is need to establish supply chain monitoring systems that check on actor functions and how they affect the quality of feed (to ensure it is not affected) from production to consumption.