COMPETITION AUTHORITY OF KENYA

ANIMAL FEED MARKET INQUIRY REPORT, 2024

NON-CONFIDENTIAL VERSION

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Acronyms

BETA	Bottom-up Economic Transformation Agenda
CAK	Competition Authority of Kenya
CCC	COMESA Competition Commission
COMESA	Common Market for Eastern and Southern Africa
EAC	East Africa Community
EACCA	East Africa Community Competition Authority
EAGC	Eastern Africa Grain Council
GMO	Genetically Modified Organism
MTP	Medium Term Plan

Acknowledgements

The Inquiry team comprised Ms. Ninette Mwarania, Dr. Arthur Odima, Ms. Rosebela Oiro and Mr. Levy Anyona of the Competition Authority of Kenya assisted by Prof. Simon Roberts and Ms. Grace Nsomba of the Centre for Competition, Regulation and Economic Development at the University of Johannesburg and the Shamba Centre for Food and Climate. Dr. Adano provided overall guidance. The work was supervised by Ninette Mwarania. Mr. Benard Ayieko, Ms. Cecilia Kyenze, Ms. Truphosa Ashiko and Ms. Mohamed Borai supported the Inquiry during the data collection phase. The Authority further wishes to acknowledge funding for the Inquiry from the Shamba Center for Food and Climate.

Executive Summary

The animal feed sector is significant for Kenya given the growing demand for meat, poultry, fish, and dairy. The Government, under the Bottom-up Economic Transformation Agenda (BETA), has specifically focused on addressing the cost, quality, and access to agricultural inputs including animal feeds, seeds, fertilizers and pesticides. Further, in the Medium-Term Plan 4 (MTPIV), the animal feed value chain has been identified as a key area requiring policy intervention. However,, there has been substantial increases in prices of animal feeds in the country despite successive Governments implementing various tax reliefs on key inputs.

The Competition Authority of Kenya undertook a Market Inquiry into the Animal Feeds sector to assess the market interactions, structures, outcomes, and other factors that may be affecting competition along the animal feed value chains and recommend interventions that will support sustainable growth and competitive markets for a robust animal feeds sector in Kenya.

The Inquiry analyzed animal feeds supply, pricing and costs, including those of main inputs. In terms of the feeds' specifications, the Inquiry focused on the two largest consumers being dairy and poultry farming in Kenya. The Inquiry covered the production and sale of goods and services involved in animal feeds, from inputs through to the end buyers. It also took into account international trade, ownership and other arrangements that underlie market outcomes affecting the Kenyan feeds market. Relevant data was collected from feed manufacturers, input suppliers, feed consumers including farmers, feed distributors, industry associations, government agencies including Ministry of Agriculture, research institutions such as Kenya Agricultural and Livestock Research Organization and Tegemeo Institute of Agricultural Policy and Development, among others.

Kenya has enormous potential for value creation, employment and investment in animal feeds to livestock production if it is to meet rapidly growing demand. Presently, consumption of meat and fish is very low and set to rapidly increase with urbanization, population growth and rising incomes. In 2021, consumption was just 13 kilograms (kg) per capita or less than half the average African consumption and just one-fifth of the world average. In order to meet the growing local demand, at reasonable prices, the industry must be competitive. This has not been the case. The Inquiry determined that the key factor for this scenario is input costs.

Other than maize, Kenya depends heavily on imported raw materials from its neighbors in the form of soybean meal, mainly sourced from Malawi, Uganda, and Zambia. The bulk of sunflower cake is imported from Tanzania. These countries have among the best conditions to grow animal feed inputs in the world, notwithstanding the effects of climate change across the globe. The markets for soymeal and sunflower cake are accordingly regional and cross-border in nature. They are also highly concentrated. Ensuring regional markets are working well is essential for growth and job creation in animal feed and livestock production in Kenya and for competitive food prices.

The Inquiry determined that very few large animal feed producers account for the majority of the commercial feed supplied in Kenya, of which a smaller number are vertically integrated and/or have long-term relationships with regional suppliers of key inputs. The largest four feed suppliers account for well over 50% of commercial feed sales. Concentration is somewhat higher in poultry and dairy feeds as evidenced by specialization by producer companies. The top four companies in each broad category account for around 75% of the national supply in Kenya. There are likely to be higher levels of concentration in narrower geographic and product market segments. The Inquiry also noted that some producers of animal feed products are vertically integrated.

There are high levels of concentration in important animal feeds inputs at the regional level taking into account the main sources of inputs for Kenya. These include soymeal and sunflower cake which are mainly sourced from Zambia, Malawi, Tanzania and Uganda. Four company groupings which operate across these countries account for the majority of production volumes. Despite inputs to animal feed being abundantly available in the region, feed prices have been extremely high, making producers of poultry, dairy, and other livestock uncompetitive. The high feed prices typically lead to high prices of poultry, eggs, milk, fish, beef, and pork products. The main cause of the high feed prices is the prices of important inputs.

Kenya feed prices are relatively high compared to available international benchmark prices. Feed prices have been much higher than would be expected in well-functioning markets with effective competition. In addition, feed prices increased substantially over 2021 and 2022, consistent with high poultry prices in Kenya for consumers. The main driver of this phenomenon is prices of inputs.

Findings on inputs markets indicate that efficient competitive markets would have meant much lower prices for Kenyan feed companies. It is estimated that lower input prices from competitive regional markets for key inputs would have meant savings of over Ksh. 3 billion per annum for producers of poultry feeds which could have been passed onto egg and poultry meat consumers. These savings on feed costs would have meant more competitive egg and poultry production, created more jobs and economic activity, and lower consumer prices.

The integration and apparent close associations of some feed producers with input suppliers raise concerns about differential or discriminatory pricing. There is evidence of margin squeezing in 2021 and 2022 against non-integrated feed manufacturers when the price of feed is assessed relative to the prices of inputs. The effect of this has been the exit of small feed producers, along with evidence of smaller producers sticking to supplying particular regions and being unable to expand their markets and provide competitive pressure to the benefit of consumers through lower prices and wider product variety.

The oligopolistic conditions for relatively homogenous inputs, and market outcomes which are inconsistent with normal and effective competition points, to possible coordination between input

suppliers, including market division and pricing. The concentrated nature of processors of soybeans and traders of soybean meal and oilcake across East and Southern Africa means that the Inquiry reasonably believe that they can set the terms and pricing on which these products are traded which has included higher prices being charged on sales to Kenya while there are export volumes at lower prices being sold into other markets including South Africa and countries outside the continent. Brokers also appear to play an important intermediary role in the supply of animal feed inputs in Kenya, however, their operation is opaque.

In addition, the mark-ups on input prices in Kenya compared with prices across the region the information exchange is concerning. This may facilitate coordination and undermine competition by smaller market participants who do not have access to the information. The possibility of information foreclosing smaller competitors is explicitly identified as an issue in the guidelines of the COMESA Competition Commission. These guidelines are similar to those applied in the European Union.

To realize its potential for rapid growth to meet demand, creating value and employment, a combination of initiatives has to be undertaken in the Kenya's animal feeds sector. A combination of competition and regulatory policies can realize better-priced products. To achieve this requires tackling the apparent anti-competitive conduct and supra-competitive pricing of inputs such as soymeal and sunflower cake, coupled with commitments by the main suppliers of feed inputs to adhere to fair and non-discriminatory pricing. Additional measures are required to improve cross-border markets and consistent regulations to facilitate trade across COMESA and the EAC. The Authority can work together with the competition authorities in these two blocs to improve regional trade and address anti-competitive arrangements which may impede this. In additional, there is need to address market fragmentation within Kenya due to county taxes that impede the free flow of goods.

Additionally, there ought to be fair access on transparent terms to information on the prices of feed inputs such as maize and soybeans. The Authority should continue to monitor the markets, in collaboration with government and regional bodies, to assess whether feed prices in Kenya diverge or converge with international feed prices, and take appropriate action where anti-competitive concerns are noted.

1. Introduction

1.1 Background

There have been concerns regarding high animal feed prices in Kenya which undermines livestock producers and lead to high food prices. Competition concerns have been raised as the animal feed markets in Kenya appear to be concentrated, with a small group of producers accounting for the majority of the supply, alongside many small feed producers. Several small feed producers went out of business in 2022, with high input costs being blamed as one main factor.

The animal feed sector is significant for Kenya with growing demand for meat, poultry, fish, and dairy for which feed is a key input. In addition, Kenya is a member of the Common Market for East and Southern Africa (COMESA) and the East Africa Community (EAC) regional economic communities, and animal feed inputs are traded with Kenya largely importing from other countries in the region. This means that the cross-border dimensions of markets and international reach of producers are highly relevant aspects. Fair competition in local, national, and cross-border markets are important to enable a growing industry in Kenya, with wide participation, as part of economic development and food security.

The Government, under the Bottom-up Economic Transformation Agenda (BETA), has specifically focused on addressing the cost, quality, and access to agricultural inputs (including animal feeds, seeds, fertilizers and pesticides). Further, in the Medium-Term Plan 4 (MTPIV)[1] various issues have been identified in the animal feed value chain, some of which can be attended to through the Authority's Inquiry. For instance, the finance and production sectors aim to create synergies among the sub-sectors through the adoption of the value chain approach. It is worth noting that dairy, beef, leather, and leather products have huge potential for livestock-related production, value addition, and market access, while ensuring quality assurance and standards. The specific priorities include supporting the dairy value chain, which targets to double dairy productivity through appropriate feeding. In addition, the interventions in agro-processing aim to promote the manufacture of animal feeds and the valorization of agricultural residues.

These concerns were among the motivations for the Authority to undertake an Animal Feeds Market Inquiry ("the Inquiry"), as per the Gazette Notice No.13310, 29 September 2023[2], in the exercise of powers conferred by section 18 (1) (a) of the Competition Act Cap 504 Laws of Kenya[3] ("the Act"). The key objective of the market inquiry is to assess the market interactions, market structures, market outcomes, and other factors that may be affecting competition in markets along the animal feed value

[1] https://vision2030.go.ke/wp-content/uploads/2024/03/FINAL-MTP-IV-2023-2027_240320_184046.pdf
[2] https://archive.gazettes.africa/archive/ke/2023/ke-government-gazette-dated-2023-09-29-no-217.pdf
[3] https://www.cak.go.ke/sites/default/files/Competition_Act_No._2012_of_2010.pdf

chains, and recommend interventions that will support sustainable growth and competitive markets for a robust animal feeds sector in Kenya.

The specific Inquiry objectives are to assess—

(a) the prices, costs, and quantities produced, supplied, and purchased at different levels from inputs supply to production and sale of different animal feed products;
(b) the market shares, concentration, ownership relationships, joint ventures, and marketing agreements for the different products and services related to animal feed and its inputs;
(c) different terms and conditions of supply for feed producers of different sizes;
(d) barriers to entry and growth of smaller feed producers;
(e) information availability, information sources, and any information exchange practices by companies, associations, and other formal or informal groupings relating to animal feed and its inputs;
(f) arrangements, including licensing and other supply terms, which may affect the sourcing and supply of animal feed including breeding stock and animal feed;
(g) trade flows of feed constituents, including maize, soybeans, and derived products, and what may be affecting the flows from other countries in the Common Market for Eastern and Southern Africa (COMESA) and East Africa Community (EAC) Regions, taking into account standards, permits, and other requirements, in light of the existing trade agreements; and
(h) the flows of demand and supply of products and services along the value chain for the main animal feed products.

The powers of the Authority under the Inquiry mean that the data can be obtained to make a thorough assessment of the market outcomes and competition issues. This enables recommendations to be made where markets are not working well, such as for policies and regulations, and means that competition issues can be identified which may be remedied by undertakings from businesses, or further investigations to be conducted of possible anti-competitive conduct.

1.2 Scope of the Inquiry

The Inquiry covers the production and sale of goods and services involved in animal feeds, from inputs through to the end buyers, and takes into account international trade, ownership, and other arrangements that underlie market outcomes that have an effect in Kenya. As animal feeds are quite diverse with different specifications to meet different customer needs, the Inquiry focuses on prioritized feed specifications, the main inputs, and the larger customer groupings. Section 2 provides an overview of the value chain, products, and relevant markets.

The Inquiry reveals that the great majority of animal feeds supplied in Kenya are for the poultry and dairy markets. The majority of input costs are accounted for by key feed constituents including derivatives of maize, soybeans, wheat, and sunflower along with vitamins and minerals. Feed

suppliers and their customers are also mainly located in several regions in Kenya, led by those around Nairobi and Mount Kenya. The main focus of the Inquiry is, therefore, on these feed products and markets, along with the main inputs and their sourcing within Kenya and across borders. This is not to say that other products and markets are not important. Where there are issues specific to products, markets and inputs which are relatively smaller in magnitude it is possible to follow up in further inquiries or investigations depending on information that may come to light.

1.2.1 Competition analysis

The Inquiry assesses competition in terms of market structures and market outcomes. This assessment considers whether the markets are consistent with competition and, where competition issues are identified, what factors explain these competition issues. The analysis involves applying and testing the competition theories to the data obtained. Further data may be required for different theories of harm and may be obtained if a follow-on investigation is launched.

The competition analysis involves:

i. **Defining markets** in product and geographic terms, which is necessary to consider market concentration in terms of actual production and capacities;
ii. Considering aspects of **vertical integration and horizontal arrangements**, including across geographies and different product categories;
iii. Analyzing **barriers to entry and growth** of smaller firms to be effective competitors including the costs and capabilities involved, as well as the strategic barriers such as obtaining low-cost inputs;
iv. Assessing **data on market outcomes** and analyzing whether these are consistent with expectations of competition including concerning costs, price benchmarks, and patterns of supply;
v. Considering possible **exertion of market power and arrangements** that may facilitate this including unilateral or coordinated conduct, vertical integration and arrangements including information exchange; and
vi. Reviewing **policies and regulations** in terms of their effects on competition.

1.2.2 Information sources and responses to requests for information

The main purpose of conducting an Inquiry under the Act is for the Authority to be able to source product and market information from companies in order to assess market structure and market outcomes. This involves obtaining company specific information, including on inputs, costs, supply quantities and pricing, to different customers and geographic areas, and the basis for company decisions. This information enables a rigorous assessment to complement the publicly available information and existing studies.

1.3 Theories of Harm to Competition

The oligopolistic nature of the relevant markets, with relatively homogenous products within different market segments, means that the main framework for assessing competition relates to factors which influence whether there is effective competition, or if competition between companies is lessened, prevented or distorted for various reasons. This includes possible explicit or tacit coordination between companies. We briefly review the literature on conduct in oligopolistic markets and the likelihood of coordinated conduct in the sub-section below.

The different levels of markets through the supply chain further mean that it is important to consider vertical arrangements including integration and agreements, and their likely effects, as part of understanding whether markets are working well. In addition, the traded nature of the inputs and the feed products mean that it is necessary to consider trade flows and arrangements which may exist across borders. These considerations entailed the inquiry gathering information at each level on market shares, prices and costs in Kenya together with analysing regional and international trade flows where appropriate. This enabled consideration of market outcomes over time to make it possible to analyze whether the outcomes are consistent with competition or raise possible flags for concern. The market outcomes may also be influenced by government policies and regulations that are not the actions of the firms themselves.

The assessment of competition and markets also includes examining barriers to the entry and growth of smaller firms, to be able compete with the larger incumbents in animal feeds and its inputs. Barriers can be exogenous in that they are due to the nature of the production processes such as the scale or technological capabilities required. Obstacles to the entry and growth of smaller firms can also be endogenous in that they are related to the conduct of the incumbent firms, such as in control over key inputs or routes to market.

1.3.1 Assessing oligopolistic markets for possible coordinated conduct

Companies which are actual or potential competitors can reach understandings or agreements to increase their collective profit by not competing. If the firms do not compete to attract customers from each other they can all charge higher prices and realise bigger profit margins (Motta, 2004). Explicit collusion is seen as the most egregious violation of competition law as it results in monopoly-like outcomes, including monopoly profits shared by the colluding parties (Connor and Lande, 2005). Cartels can agree to limit output, raise prices, or divide markets at the expense of consumer welfare (Carlton and Perloff, 1994; Lande and Marvel, 2000). Cartels may combine an understanding on pricing with forms of market division, as agreeing on how to allocate sales into markets will undermine competition on price.

Cartel members can also take actions to harm competitors in the market that are not part of the cartel (Krattenmaker et al, 1987). Firms may be able to raise the costs of their competitors in a way that

enables the colluding firms to raise their prices and/or discourage entry that would otherwise erode prices (Lande and Marvel, 2000; Langenfeld and Silvia, 2004).

Coordination between firms can be explicit or tacit. Firms engage in explicit collusion when they mutually devise a common plan of action and exchange mutual assurances to follow that plan (Motta, 2004; Harrington 2008). Tacit collusion occurs when firms are able to coordinate their behaviour simply by observing and anticipating their rivals' pricing behaviour without any communication or reaching a common understanding (Harrington, 2007). Arrangements such as agreeing to share information which undermines competition or using common price and cost benchmarks likely go beyond tacit coordination to constitute collusion.

To effectively combat cartels, collusive arrangements must be identified, prosecuted and penalised (Harrington, 2006). Methods of identifying likely cartels can be grouped into consideration of structural features and behavioural signals. In general, cartel conduct is more likely where the structural features include high concentration, relatively homogenous products, high barriers to entry, stable demand conditions, firm symmetry, and multi-market contact between firms (Church and Ware, 2000; Motta, 2004; Harrington, 2007). For example, there have been many cartels identified in concentrated industries for food, agriculture and industrial products, including export cartels (Connor & Helmers 2006; Connor, 2020; Hernandez & Torero, 2013; Vilakazi & Roberts, 2019; Jenny, 2012). However, these structural features do not necessarily mean there is collusion nor does the absence of these features mean there cannot be collusion.

The stability of a collusive agreement or understanding requires monitoring of firms' compliance as each firm has an individual incentive to deviate from a collusive action because it can increase its own profits by expanding its market share (Motta, 2004). Collusion is thus enabled by mechanisms to 'detect deviations' from a collusive action (Church and Ware, 2000; Marshall and Marx, 2012). Second, the stability of collusion is assisted by firms recognizing that deviation will attract a response (or 'punishment') – which may take the form of rivals producing much higher quantities or selling their products at much lower prices (Carlton and Perloff, 1994; Motta, 2004; Porter, 2005).

Mechanisms for monitoring, detecting, and punishing deviations from collusive understandings include exchanging detailed information on sales volumes and using excess capacity to be able to flood the market (Marshall and Marx, 2012; Garrod, Harrington, Olczak, 2021). For example, cement cartels have included information sharing on sales volumes given the variable nature of cement demand (Roberts, Simbanegavi, Vilakazi, 2023; Khumalo et al., 2014).

Vertical integration can aid in monitoring as well as in deterring new entry which may undermine the cartel (Church and Ware, 2000; Khumalo et al, 2014). Networks of relationships, cross-ownership and multimarket contacts can also facilitate collusion. This is equally the case where cartel conduct stretches across borders (World Bank, 2016). Importantly, if the firms control a significant proportion

of the regional market, the conduct can also undermine the benefits of reducing trade barriers to enhance the flow of goods, and any efforts by governments to support new entrants in certain sectors through industrial development strategies (Roberts, et al., 2017).

Cartels and other anticompetitive agreements can be regionally and internationally-based. The most prominent illustration is a cartel that splits markets by assigning nations to certain suppliers. Although it looks as if each nation has only one or two suppliers, this is due to collusion at the regional level which hurts consumers in every nation and undermines regional trade. Firms can equally share or allocate markets by allocating market shares across a region and/or fixing prices at the regional level. Cartels working along these lines have already been discovered to be active in several southern African nations in the fertiliser, cement, and concrete product industries (Roberts, 2020). According to the cartel agreements in these cases, the markets of larger countries are split between two or three producers, while the markets of some smaller economies were controlled by just one provider, and there were understandings on setting prices above competitive levels (Roberts, 2016). Regional and international collusion pose challenges for competition enforcement and point to the importance of regional authorities (Ezrachi and Kindl, 2011; Martyniszyn, 2021).

Behavioural screening involves assessing the conduct of firms and observing the market outcomes. For example, the way firms' price or supply quantities over time are relevant. If firms adjust supplies to demand shifts such that market shares are stable, then this is an important red flag. Parallel movement in prices or unexplained price increases may also raise concerns, however, it is important to dig deeper into factors such as common costs (Harrington, 2008). Uniformity in pricing such as through firms using common pricing components not related to individual firms' actual costs, or through limited discounting, differs from what would be expected under competition. Common approaches to pricing make it easier to monitor compliance by members in the cartel, as compared with differential pricing and discounts reflecting market conditions and differences between customers consistent with competitive interactions to increase sales (Harrington, 2007).

1.3.2 Information exchange

Information is important for businesses and consumers by providing reliable data for better planning and forecasting. It enables businesses to adjust supply to meet market demand and guides new entrants or investors seeking to establish themselves in the new relevant market. For instance, demand data can facilitate more efficient distribution of products to regions which have little to no supply of the relevant products. Consumer demand information can also encourage product differentiation to align with consumer preferences. In the case of consumers, information on alternative suppliers helps them compare prices, quality, and product features, thereby applying competitive pressure on suppliers.

However, information exchange may raise competition concerns in instances where the nature of information being shared may facilitate horizontal coordination amongst competitors. In distorting decision-making by firms, information exchange can also be a horizontal restrictive practice in itself.[4] The Authority has guidelines on restrictive business practices, as does the COMESA Competition Commission, which include information exchange. These guidelines are broadly consistent with the approach adopted by the European Commission which draws on case precedents in that jurisdiction. As reflected in the European Commission's revised horizontal guidelines[5] adopted on 1 June 2023, the main principle with regard to information exchange is that (para 374) 'each undertaking determines independently its economic conduct on the relevant market'. There should not be 'any direct or indirect contact between undertakings of such a kind as either to influence the conduct on the market of an actual or potential competitor…. where the object or effect of those contacts is to give rise to conditions of competition which do not correspond to the normal conditions of the market'.

The Authority's Guidelines on Restrictive Trade Practices specifically address the role of information exchange in horizontal agreements, focusing on price and market division under 'Competition guidelines on restrictive trade practices on horizontal agreements' (p.13). A horizontal agreement can be between actual and potential competitors. The Kenyan competition law also explicitly identifies associations as potential areas for coordination. Additionally, in complex markets, coordination for market division may be facilitated by the exchange of publicly available information, cross-shareholdings, or participation in joint ventures. In such cases, increased transparency or communication may be needed to reach terms of coordination, which can also raise competition concerns.

The COMESA Competition Commission guidelines on Restrictive Business Practices, 2019 address the role of Information Exchange Agreements as a horizontal restraint (pg.23). Market characteristics relevant to considering information exchange are set out including markets that are more concentrated, transparent, and with homogenous products. In addition, the CCC guidelines point to possible foreclosure of the market caused by information exchange 'if some market players do not have access to the information that is indispensable to compete on the market'. Further, the COMESA guidelines indicate that the assessment will include whether the information being exchanged is

[4] Note that information exchange in the EU can be a contravention by object.

[5] Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements. The revised chapter on information exchange includes additional guidance on: (i) the concept of commercially sensitive information; (ii) the types of information exchange that may constitute restrictions of competition by object; (iii) potential pro-competitive effects of data pools; (iv) indirect forms of information exchange, including hub-and-spoke arrangements; (v) anti-competitive signalling via public announcements; and (vi) practical measures that companies can take to avoid infringements, such as limiting the scope of the exchange, using clean teams or independent trustees and public distancing.

independent or ancillary to other business practices. In instances where the exchange forms part of another business practice, 'the assessment of information exchanges that form part of another business practice will be carried out in the context of the assessment of the main horizontal business practice itself.'

The European Commission Guidelines reflect the most recent case law in the European Union and recent literature on coordination. They are thus a useful source even while Kenyan law will set relevant precedents in due course. In the EU, if there is an information exchange arrangement which conditions competitors' conduct it contravenes the law if it establishes or is part of an agreement between undertakings, a concerted practice or a decision by an association of undertakings. There is then a rebuttable presumption that undertakings that take part in a concerted practice and that remain active on the market take the information exchanged into account in determining their conduct on the market. The exchange of 'commercially sensitive information' may enable a common understanding between competitors, and/or create 'mutually consistent expectations regarding the uncertainties present in the market… even without an explicit agreement on coordination'.

The EC Guidelines (para 382) also point to concerns of foreclosure on the same market where the information exchange 'places competitors that do not take part in the exchange at a significant competitive disadvantage compared to the undertakings that participate in the exchange'. This may also be of third parties in a related market where there are, for example, 'vertically integrated companies that exchange information in an upstream market may gain market power and collude to raise the price of a key input for a market downstream. They could thereby raise the costs of their competitors downstream, which could result in anti-competitive foreclosure in the downstream market'.

In terms of the nature of the information exchanged, regard needs to be had to the nature of the products or services offered, the size and number of the undertakings involved and the volume of that market. Information on pricing is generally considered commercially sensitive and the prohibition on coordination applies even if the exchange does not have a direct effect on prices paid by end users. Other categories of potentially commercially sensitive information include information on costs, capacity, production, quantities, market shares, customers, plans to enter or exit markets, or concerning other important elements of a firm's strategy that undertakings active in a genuinely competitive market would not have an incentive to reveal to each other.

The exchange of aggregated information can be problematic where it reduces uncertainty regarding the operation of the market in question and, as such, conditions the decisions of firms. This is especially the case where it takes place between a relatively small number of undertakings with a sufficiently large share of the relevant market, and the exchange of aggregated information can give rise to a restriction of competition. The Guidelines highlight that where undertakings that form part of a very tight and stable oligopoly, exchange of aggregated price information, such as on prices this

may enable them to identify deviation from a collusive outcome and take steps to keep collusion stable.

Frequent and more recent information is more likely to lead to coordination. Information may be exchanged indirectly and, depending on the facts of the case, the participating competitors and the third party may all be held liable for such collusion.

The market characteristics relevant for considering information exchange are well established and are those which impact on the likelihood of coordination. They include (from the EC Guidelines), transparency, market concentration, transparency, barriers to entry, homogenous products and market stability.

1.4 Report Structure

The remainder of the Report is organized as follows. Chapter two provides a market overview and the value chain levels. Chapter three focuses on the feed regulatory framework. Chapter four assesses markets for feed. Chapter five addresses input markets. Chapter six contains an analysis of competition and market outcomes. Finally, in chapter seven, conclusions are summarized and recommendations are made.

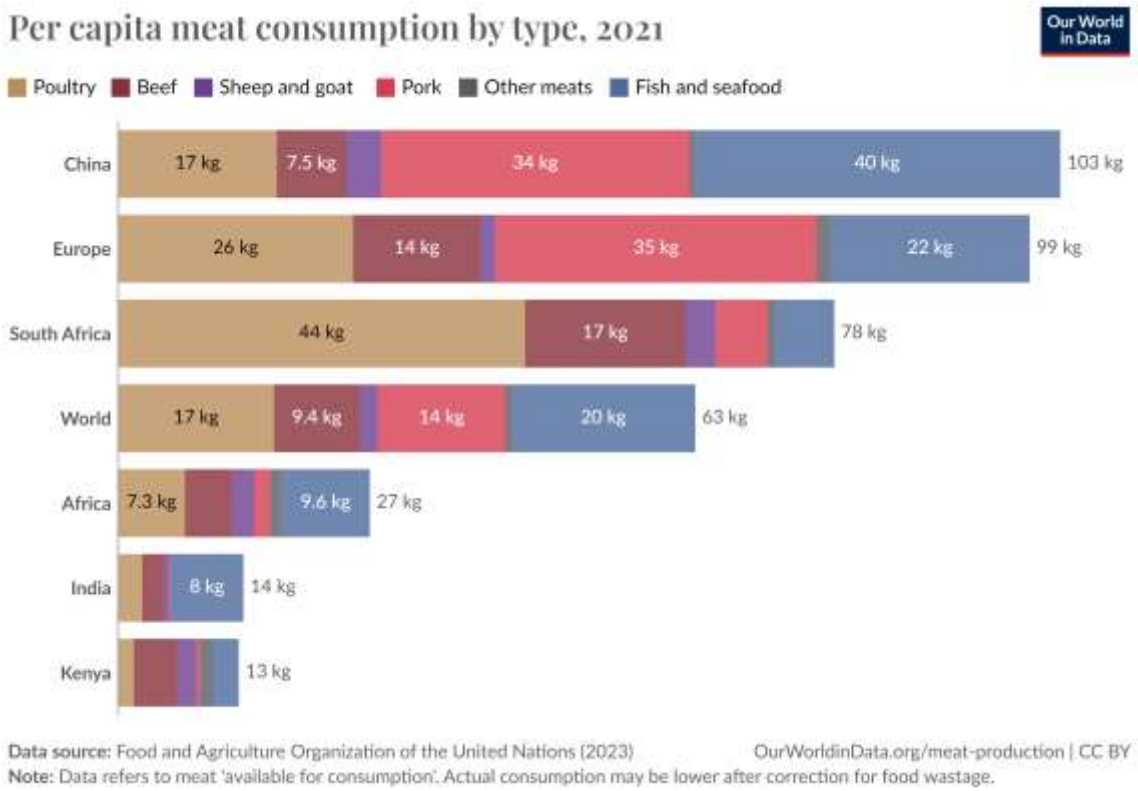
2. Overview of Markets and Value Chain Levels

2.1 The animal feed value chain

Animal feeds are generally referred to as foods that are used to feed farm animals. Feeds are produced by selecting and blending ingredients to provide highly nutritional diets that both maintain the health of the animals and increase the quality of downstream animal protein products such as meat, milk and eggs. Feed is the largest and most important component to ensuring safe, abundant and affordable animal proteins. The main factors determining the composition of animal feed are the nutritional value of the constituents to match the requirement of the specific animal, the rules and regulation of the government and the availability and price of constituents.

The demand for animal feed is a derived demand, as it is related to the production and consumption of livestock. Thus, the animal feed value chain is influenced by the nature of demand for livestock products and how livestock production industries have evolved over time. International comparisons of meat and fish consumption indicate that Kenya's consumption is very low at just 13kg per capita in 2021, less than half the African average and just 20% of the world average (Figure 1).

Figure 1: Per capita meat consumption, Kenya and selected international comparators

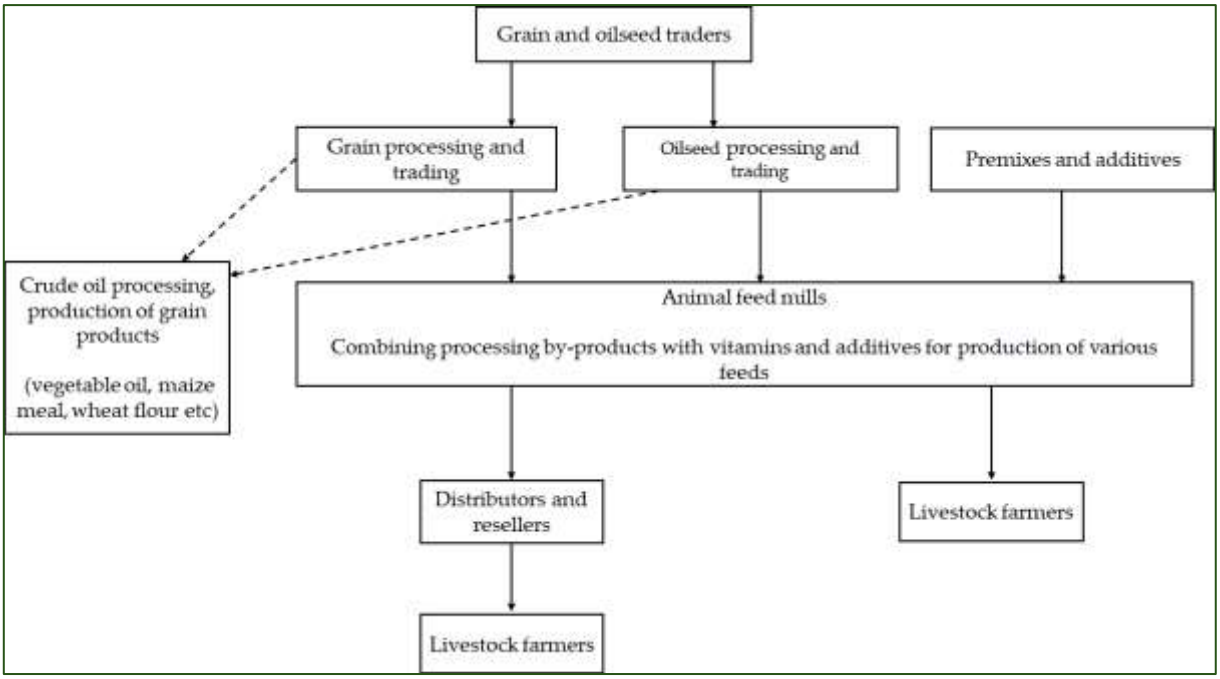


The comparison highlights that very substantial growth in consumption can be expected with ongoing urbanization and increasing incomes, alongside population growth. Consumption has been biased to beef while growing demand will more likely be met by farmed chicken and fish which are relatively cheaper to produce in large quantities. Chicken and fish also rely heavily on animal feed. There is thus a major opportunity for the animal feed industry in Kenya to meet growing demand, if it can be competitive. If not, then the growing demand is likely to be met by imports of chicken and fish, and by growing calls for protection which will further raise food prices to consumers.

The international comparison also reflects consumption levels in China which are similar to Europe, after the rapid growth and urbanization recorded by China over the past three decades. Chinese demand has also driven the expansion of soybean production and exports from Brazil. Other countries such as India still have very low meat and fish consumption levels, at similar levels to Kenya. Global growth in countries like India, given their population size, this will drive continued demand for animal feed inputs globally. Given the good land and water availability in East Africa in Kenya's neighbours, there is good potential to expand agriculture production very substantially which can ensure competitive feed inputs.

On the other hand, the availability of feed is influenced by the supply side. The ability to meet demand is largely dependent on the availability of raw materials at competitive prices. This means strong linkages from animal feed back to the production, processing and trading of the main raw material inputs such as maize, soybeans, sunflower, wheat by-products, along with premixes of vitamins and additives (Figure 2).

Figure 2: The animal feeds value chain



Source: Compiled by authors

The Kenyan feed industry produces a variety of feeds for various livestock categories, with the main feed categories being for poultry and dairy. There is some production of feeds such as for pigs, fish, horse, rabbit, dog and cat feed, but these make up a very negligible proportion of total industry production. As a result, the remainder of the report will focus on the main feed categories of poultry and dairy.

At the upstream level of the value chain, interviews and data collected within the ambits of the Inquiry have indicated that agricultural products such as maize, soybean, sunflower and wheat by-products are the main agricultural inputs for feed production across all feed categories. These agricultural products are processed by millers, edible oil producers and ginners, with some in the form of by-products. The different types of feed use different combinations of raw materials, based on the nutritional requirements of the different types of livestock.

For instance, the weight of broiler chickens after their six-week raising period is an important factor in the sales of these chickens. The heavier the bird, the better the price. This requires high levels of

protein in the raising period, with soybean meal as a key source and therefore a key raw material.[6] On the other hand, dairy production requires feed that is high in carbohydrates and fiber for the production of milk, which are sourced from milling by-products of maize and wheat.[7]

We observe that the sourcing of raw materials takes place through a combination of local Kenyan markets, regional markets and international markets. For instance, milling by-products from maize and wheat are sourced from local millers, while protein sources such as soymeal and sunflower meal are sourced from Uganda, Tanzania, Zambia and Malawi. Premixes, vitamins and other additives originate from international markets such as China, the Netherlands and Germany.

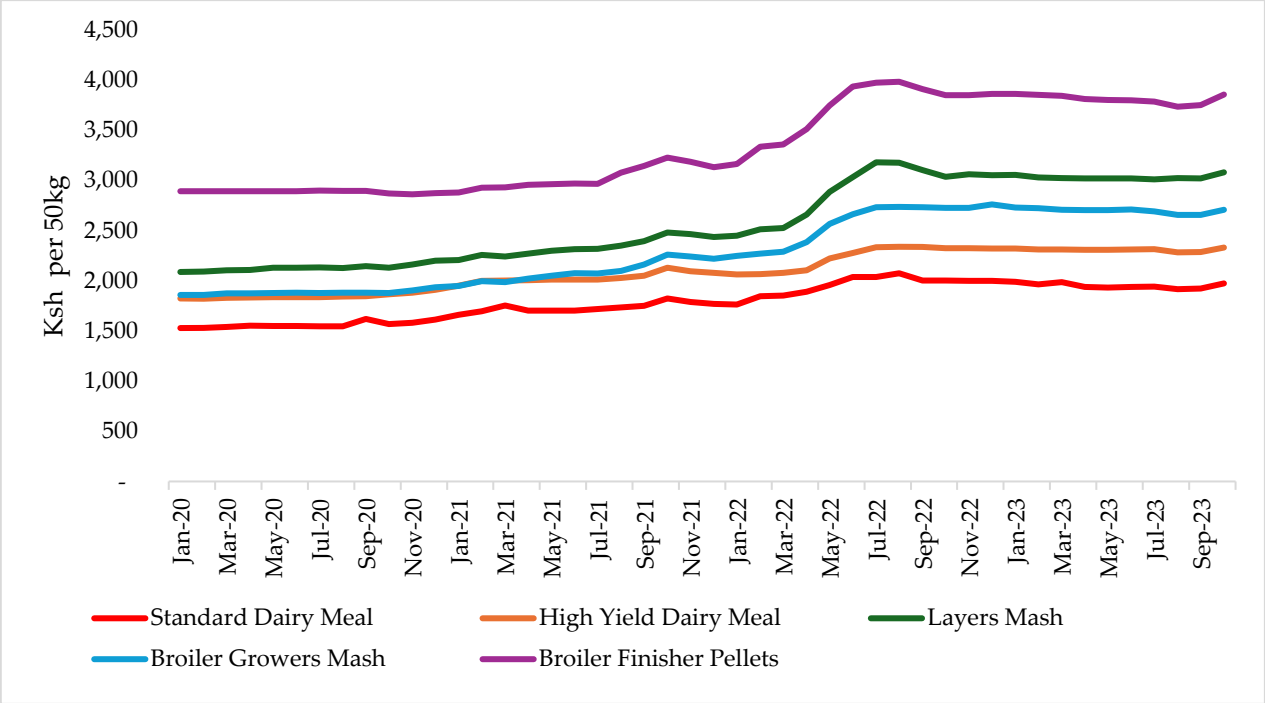
Given that the prices charged for raw materials have a direct impact on feed production, it is important to understand the conditions under which raw materials are sourced. This includes the structure of markets in the upstream processing and trading of these inputs, the relevant transport costs and terms of trade, as well as other market factors such as product seasonality which may affect the supply. For instance, the cross-border oilseed processing and trading market is concentrated, with few processors and traders operating across the east and southern African region (see Nsomba et al., 2022). This has important implications in terms of the sourcing options that feed producers have, with important insights on how we start to understand competition in the animal feeds industry. The upstream oilseed and grain processing market is where we begin to unpack the effects of vertical integration and horizontal arrangements across borders and product categories along the animal feeds value chain. Section 2.3 considers these factors together with the specification of the main feeds.

Prices of feed and inputs

The Inquiry was partly motivated by increases in animal feed prices in recent years. The prices of the main feed categories increased significantly from mid-2021 to mid-2022, by 31% for poultry grower mash, 33% for broiler finisher pellets and 37% for poultry layer mash (Figure 3). Increases have, however, been much lower for dairy meal.

[6] Interview with Firm I.
[7] Interview with Firm J.

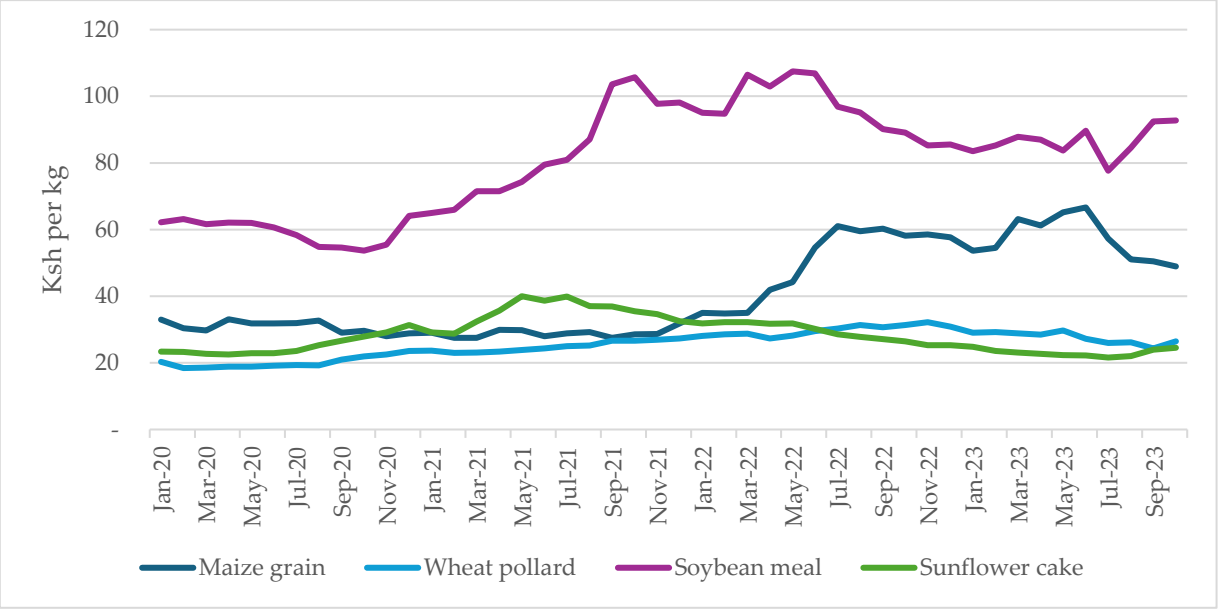
Figure 3: Average prices for main feed categories



Source: Compiled from RFIs

It is evident that there have been very substantial cost pressures from the prices of the main feed inputs, especially maize, soymeal and sunflower cake (Figure 4). Each of these inputs recorded price increases of between 50% and 100% in different 12-month periods between January 2020 and October 2023.

Figure 4: Average prices for main feed inputs



Source: Compiled from RFIs

2.2 Main feed products and customer segments

In general animal feeds are categorized into three broad types, namely: roughages, concentrates, and mixed feeds. Roughages comprise forage crops, cultivated fodders, natural pastures, and browse. Concentrates on the other hand are energy-rich and nutritious feed resources used to supplement roughages and other feeds derived from cereals, such as maize, millet, sorghum, and legumes or oilseeds cakes from soybeans, cotton, and sunflower.[8]

Roughages encompass silage, pasture, hays, forages, and feed by-products with high fiber proportions. Concentrates, on the other hand, are high energy-rich grains and molasses, protein and energy-rich supplements, by-product feeds, vitamin supplements as well as mineral supplements. These can be included in composite mixed feeds which are manufactured to produce a balanced ration for optimal performance, whether this is milk yields, growth of meat, or egg production.

The main feed categories considered in this report have a subset of feed types, which are mixed from the upstream raw materials and based on the nutritional component and feeding regimes prescribed for different types of livestock. Table 1 lists the different feed specifications in each feed category.

[8] Ministry of Agriculture, Livestock and Fisheries: National Feed Inventory and Feed Balance Assessment Report 2021

Different feed producers will tend to name these feed specifications differently but are essentially in reference to these broad specifications.

Table 1:Standard feed specifications for poultry, dairy, and pig feed

Category	Specifications
Poultry	• Broiler: ❖ Starter/grower/finisher mash ❖ Starter crumbs/grower pellets/finisher pellets • Layers: ❖ Chick mash/grower mash • Kienyeji: ❖ Mash
Dairy	• Early calf weaner pellets/cubes • Dairy meal • Economy meal • Standard meal • High-yield meal
Pig	• Starter/Grower/Finisher • Sow and weaner

Source: Compiled by authors

From the information collected under the inquiry, there are generally two routes to market, with the main avenue through distributors and resellers, and the other direct to livestock farmers. There are indications that it is only very large livestock farmers that buy directly from feed producers, facilitated through long-term contracts and based on their ability to procure large volumes.[9] This is also particularly the case where feed producers are vertically integrated into the supply of breeding stock, broilers and layers in the poultry industry.[10]

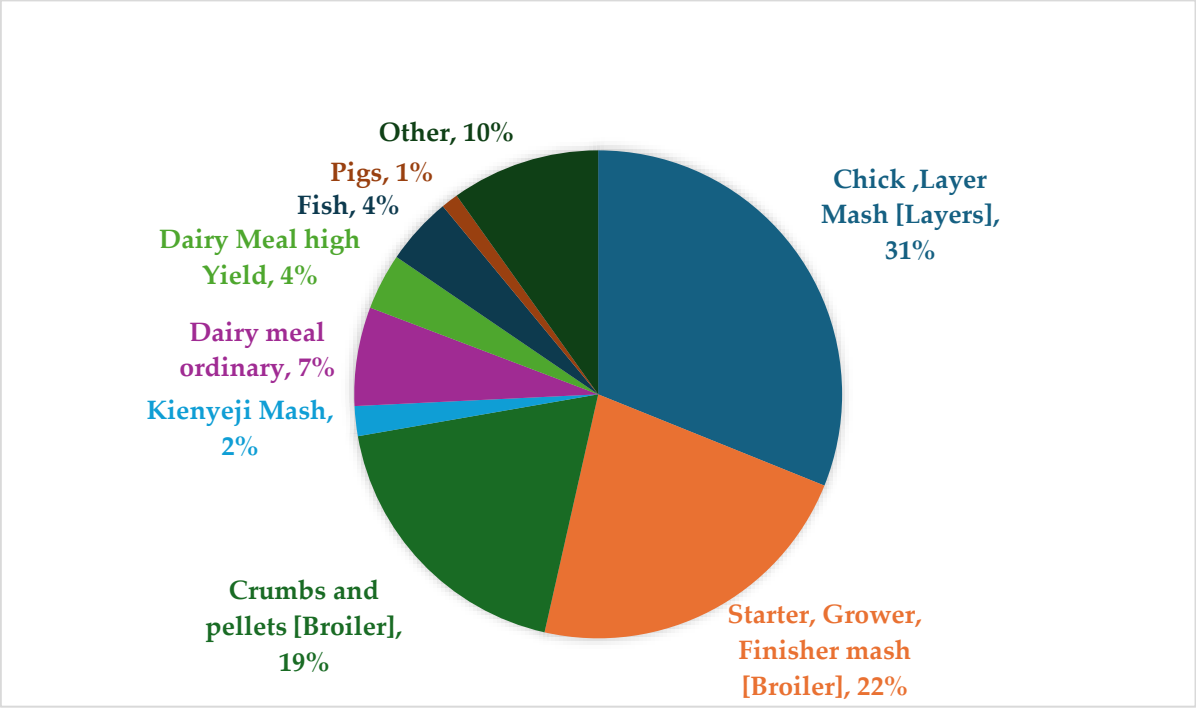
Some feed producers have indicated that 80-100% of their feed is sold through distributors and resellers.[11] The arrangement with distributors is typically that they will buy directly from the feed producers plants, and transport to their specific regions at their own cost, although with commission

[9] Interview with Firm D.
[10] Interview with Firm J.
[11] Interview with Firms J, D, I.

or allowances to cover from this transport cost.[12] These issues are assessed in section 2.2, together with the role of geographic regions in the selling of feed.

The largest broad feed categories in Kenya are poultry and dairy (Figure 5), on which the Inquiry focuses. Around 70% are for poultry, while around 20% are for dairy.[13] The remaining animal feeds for fish, pigs, and other livestock are a very small proportion of the total.

Figure 5: Proportions of feed categories, by value for responding companies



Source: Compiled by authors from feed company interviews and data submitted

2.2.1 Dairy Feeds

The majority of dairy meal is produced in mash form, except pellets and cubes that is fed to calves during the dry season.[14] The dairy meal is loose and contains finely milled particles that are consumed

[12] Interview with Firm C.
[13] Note that the largest single feed supplier in Kenya failed to provide a breakdown of their feed supply which means the proportions are an imperfect representation.
[14] Interview with Firm I.

with ease by dairy animals. Within the dairy feed categories, the standard dairy meal yields around 10 to 15 liters of milk, high-yield dairy meal is considered a premium feed which yields approximately 15 to 30 liters of milk production, and super high yielder is intended for cows producing above 30 litres of milk per day.[15] The economy meal is mainly used when a cow is going through lactation.[16] The amount of milk produced by the cow is based on the amount of protein ratio used in the feed. More sunflower cake, soya, or cotton cake is added to the depending on whether it is high yield, super high yielder, or dairy meal plus.

2.2.2 Poultry Feeds[17]

The poultry value chain has the largest variation in feed types, differentiated by the type of bird being raised (broiler, layer, or *kienyeji*) and even further by the stage of the feeding regime (starter, grower, and finisher). It can be produced in mash or pellet form. Pellets are produced by adding heat and water to the mash feed, which is pressed through a pelleting machine that molds the feed into pellet form.[18] The same process is used to produce crumb feed, which is a smaller size of pellet feed used to feed small broiler chicks.[19]

Chick Starter Mash: this is formulated for baby layer chicks and contains the critical nutritional requirements for young birds to develop strong muscles, healthy bones as well as fluffy feathers. The protein content usually varies from 20% to 24%. It is fed to layer chicks between 0 days to 6 weeks. The key ingredients are white maize, maize germ, cotton seed cake, soya beans, sunflower oil cake, or fish meal.

Grower Mash: this is fed to layer birds that are between 6 to 20 weeks old. It has a protein content ranging from 16% to 18% and has lower calcium content in comparison to a normal feeding meal. It does however stimulate consistent growth of birds.

Layers Mash: This is fed to birds to supply them with the energy, proteins, and minerals that are essential for sustained egg production from 19 weeks until the animal is discarded (normally after two years).

[15] Interview with Firm J.
[16] Interview with Firm J.
[17] Review of brochures from various animal feed manufacturers in Kenya.
[18] Interview with Firm C.
[19] Interview with Firm C.

Mash feed is considered more suitable by the industry for layer birds, which are free to roam around the pen.[20] Layer feed also contains ingredients that make it difficult to produce in pellet form, because of high levels of salt and calcium.[21]

The feeding period for **broilers** is six weeks after which they are sold. In a two-phase regime, the farmer uses starter feed for approximately the first 21 days and finisher feed for the second 21 days.[22] A three-phase regime consists of the first 21 days of starter feed, followed by grower feed until 35 days (for 14 days), and lastly finisher feed for the remaining 7 days (Gondwe, Nsomba and Roberts, 2024). Broiler feed is also differentiated between mash and pellet (and crumb) feed. Mash feed is a simple combination of raw materials that yields a moist powder form of the feed. Birds exert more energy when feeding on mash feed, given that it is in powder form.

Broiler Starter Mash: the feed formulation is for birds in the initial phase and has a growth promoter and a coccidiostat. **Broiler Mash:** contains all the essential nutrients young birds need to grow strong muscles, healthy bones, and perfectly fluffy feathers. **Broiler Finisher Mash:** the feed formulation has high energy, vitamins proteins, and vitamin content. It results in high meta quality at the finisher level and is fed to the broilers after 22 days until they are 42 days.

Broiler Starter Crumbs: These are complete feeds intended to start chicken for the meat market. It is used at the first stage of the feeding programme to rear meat birds. **Grower Pellets:** this is an advanced feed formulation for grower broilers which catalyses their growth and frame development and weight gain. It's fed to birds between 11 to 24 days and improves their performance. **Broiler Finisher Pellets:** these are high-energy feed pallets formulated as finishing feed for broilers and contain nutritional specifications and nutrient requirements in the final weeks prior to the sale of the birds.

Farmers prefer broiler birds to exert as little energy as possible when feeding to maintain their weight, so they will opt for feed in pellet form, which ensures uniform growth and less feed wastage.[23]

Kienyeji Mash: The feed formulation has 16% protein and digests easily. It is nutrient-rich, providing the starting, growing, and finishing nutritional requirements for Indigenous chicken intended for eggs or meat. **Kienyeji Layers Mash:** This is a premium feed recommended for kienyeji birds from 10% point of lay to culling to stimulate early and continued peak production of quality eggs with yellow yoke.[24]

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[20] Interview with Firm I.
[21] Interview with Firm C.
[22] Much more finisher feed is required, however, as the adult bird consumes more than a young chick.
[23] Interview with Firm I.
[24] Interview with Firm C.

2.2.3 Other feed categories

Pig feed is also produced as mashed beef, with starter, grower, and finisher feed. Producers also produce a sow and weaner feed intended for breeding pictures, enabling fast and uniform growth in young pigs and high milk production in the breeding pig.

Starter and Grower: Pig starter and grower feed typically contains 16% protein with added vitamins and minerals. This feed is intended to be the first solid food for suckling pigs; it has high energy levels and complete fortification to help young pigs grow.

Sow & Weaner: This feed is made with high protein levels and nutrients that help boost appetite while also promoting the production of lean meat. This diet ensures uniform growth at a fast pace for young pigs and helps boost milk production and fertility in breeding pigs. The feed is rich in essential amino acids and nutrients that are needed to ensure early weight gain for weaners, thus providing overall good health.

Pig Finishing Meal: A pig finishing meal is designed to help pigs grow and mature quickly with the least amount of fat deposited on their bodies. It is rich in protein plus other essential nutrients that ensure proper weight gain.

Fish Starter: The fish starter feed is specially formulated with vital nutrients that facilitate quick growth, ensure the optimal health of young fish, and promote quality meat production.

Fish Grower: This is a feed aimed at sustaining the growth and development of fish after they have outgrown their starter phase. Typically, this is before the finishing phase, but it also depends on specific species' needs due to different commercial formulations adopted.

Fish Finisher: The specifications of this feed are established to facilitate the rapid and healthy growth of fish such that they attain market weight without wastage.

2.2.4 Main geographic locations of supply and demand

Identifying areas with intensive commercial livestock farming in Kenya is critical to identify the main geographical markets for feed. Commercial poultry farming happens relatively close to the main urban areas. The central region in Kenya, which includes the highlands is known for intensive commercial dairy farming. This includes counties like Kiambu, Muranga, and Nyeri. Similarly, Rift Valley regions like Nakuru, Uasin Gishu, and Bomet are known for intensive dairy and poultry farming. Eastern Regions such as Embu, Meru, and Machakos specialize in commercial dairy and poultry farming while the coastal regions like Kilifi and Kwale are renowned for poultry farming. The Nairobi region and its environs are concentrated in dairy, poultry, and other livestock such as pigs for commercial purposes.

Some animal feed companies have national distribution while others operate in some regions. However, even the large national companies tend to have some areas on which they focus to a greater extent. While each company appears to have its configuration of supply areas, they can be grouped into three broad geographical areas of which the Central and Northern regions are the biggest.

a) **Central and Northern Regions**. This includes Nairobi and its environs, Kiambu, Muranga, Nyeri, Kirinyaga, and Tharaka Nithi. The central region has a mix of dairy and poultry production, with dairy thriving due to the highland nature of the area. [redacted]

b) **Western and Parts of Rift Valley Regions**. This region encompasses Nakuru, Uasin Gishu, Bomet, Kericho, Kisumu, Kakamega, Kisii, Homabay, Busia, and Migori counties. There is a noticeable concentration on poultry, with some parts of the western markets having some dairy activity. [redacted]

c) **Coastal and Parts of Eastern Regions**. This region covers the Mombasa, Kilifi, Taveta, Kwale, Makueni, Machakos, and Kajiado areas. These areas are predominantly focused on poultry farming with minimal dairy activity. [redacted]

2.3 Main inputs and sources

As described above, the production of animal feeds requires various raw materials, including key agricultural products. In this section, we focus on three main categories of inputs: agricultural grains, agricultural oilseeds, and premixes and additives. We also consider these inputs in the context of feed specifications as set out in Table 1.

2.3.1 Input requirements for different categories of feed

Within the category of agricultural grains, animal feeds use maize grain and by-products of maize and wheat milling. Maize and wheat provide an important source of energy. These raw materials also have high levels of starch through their carbohydrate content, which in dairy production supports high milk yields. This is reflected in the proportion of inputs made up of maize and wheat products by volume in dairy meal (Figure 6). The same is also reflected in standard layers mash, given that poultry layers also require more energy (and fiber) relative to poultry broilers.

There are substantial differences between feed categories in terms of the proportions of inputs used based on the different nutritional contributions that the inputs make to the feed and their price. It is also important to recognize that some inputs are much more expensive and therefore have a much higher share by value than they do by volume. For example, in broiler finisher pellets, maize grain and germ makes up around half of the feed content by volume and under 40% by value while soybean

meal and soybean full fat, is around a quarter by volume, but 44% by value, which reflects the relatively high price of soybean.[25]

The other main oilseed we considered is sunflower. This is used as a sunflower cake in animal feeds. By both volume and value, sunflower is most prominent in dairy meal while also present in poultry feed to a lesser extent. While it is a source of protein, it has a higher fiber content useful for digestion in animals, and is most preferred in dairy farming.

Feed production also uses premixes and additives for feed production. Premixes consist of vitamins, minerals, and specialized feed additives that animals in different stages of life need to develop, grow, and perform (DAFF, 2021). The premixes are usually a small proportion of the feed volume. The premixes are tailored to the type of feed being produced and can make a large difference to the effectiveness and performance of animals (DAFF, 2021). Premixes are generally sourced from deep sea markets, with some feed producers procuring them through local traders.

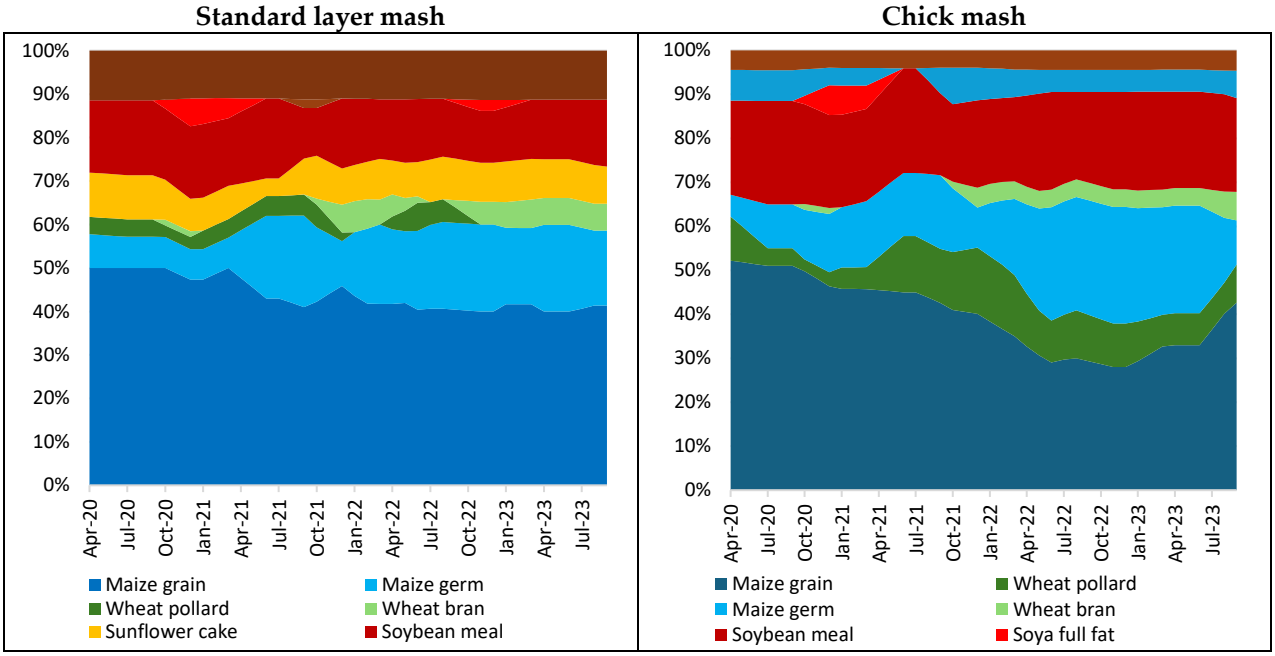
When we consider the changes in composition by feed input, we can see that there are fairly constant ratios of protein (from soy and sunflower); energy from maize, maize by-products, and wheat by-products; and pre-mixes and additives (Figure 6). Within these broad groupings, some by-products can be varied, reflecting their substitutability.

- Layer mash, the largest single category, has just above 60% by volume composed of maize and maize germ as the biggest constituent by volume, supplemented by wheat bran and pollard (which can be seen to be practical alternatives, with pollard in some months and bran in others). Soymeal and sunflower cake account for around 25%.
- Chick mash and finisher mash have around 60% energy (maize and wheat). Maize germ and maize grain are substitutes. For Chick Mash soymeal is relatively more important than sunflower cake.
- Starter crumbs and finisher pellets are similar, with a somewhat lower energy share (and including broken wheat), while the protein share is higher in soybean, including full-fat soya alongside soymeal.

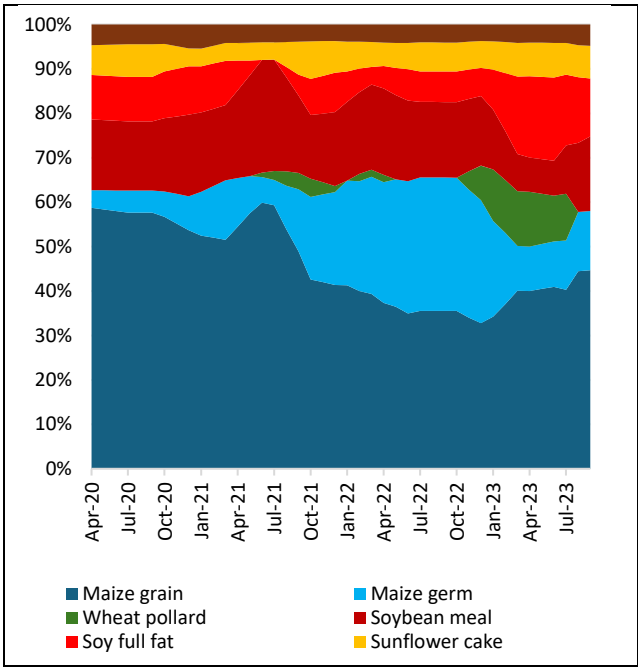
[25] Soybean full fat is obtained by a mechanical extraction method while soybean meal is obtained through a more advanced method of extracting oil out of the soybeans, called the solvent extraction method, yielding a finer texture to the soybean meal relative to soybean full fat (Willis, 2003). Soybean full fat contains more fatty acids relative to soybean meal, while soybean meal has a higher protein content. Soybean full fat and soybean meal are therefore used to varying degrees based on the dietary requirements for broilers at different stages of the feeding regime.

- For dairy meal, the energy is around 70-80% with a much smaller share of premixes and protein. There is also a very high proportion of maize and wheat by-products used especially in the standard dairy meal.

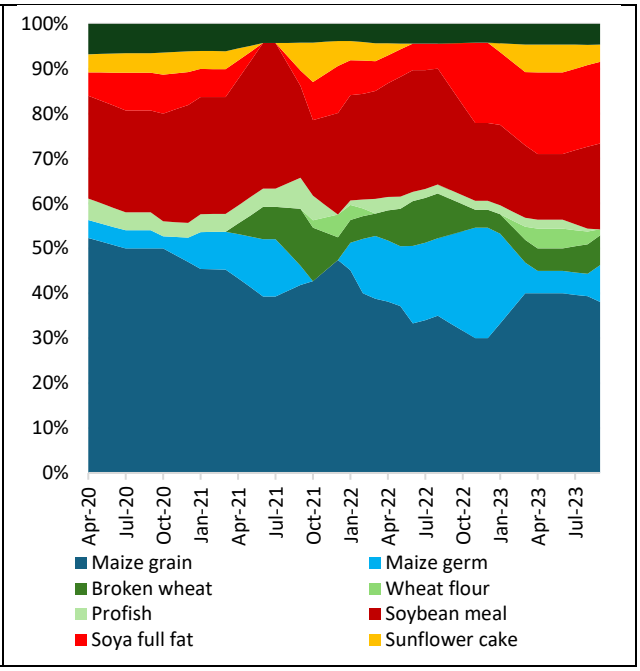
Figure 6: Composition of main animal feeds, by volume (for medium/large animal feed producers)



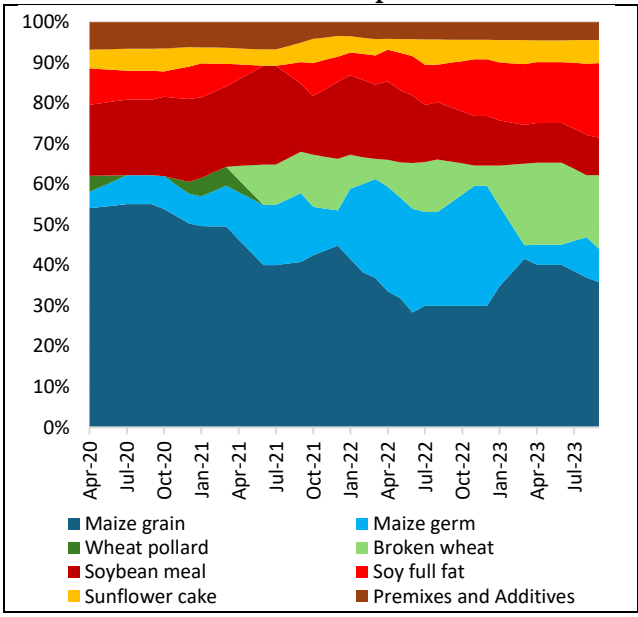
Broiler finisher mash



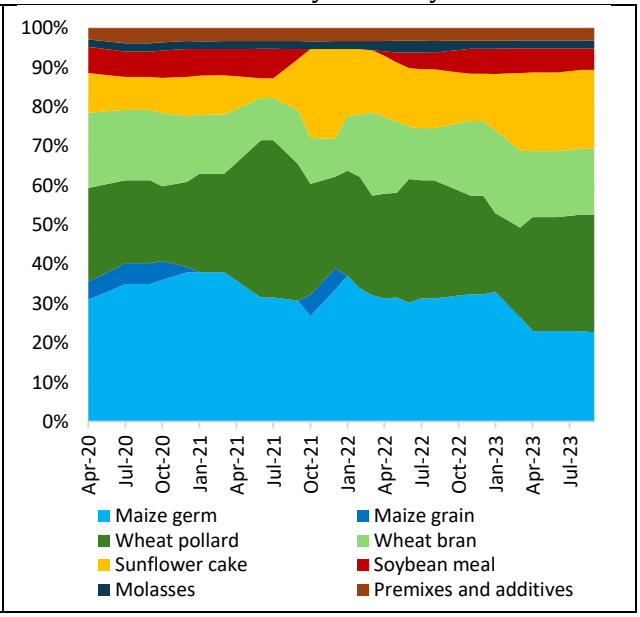
Broiler starter crumbs



Broiler finisher pellets



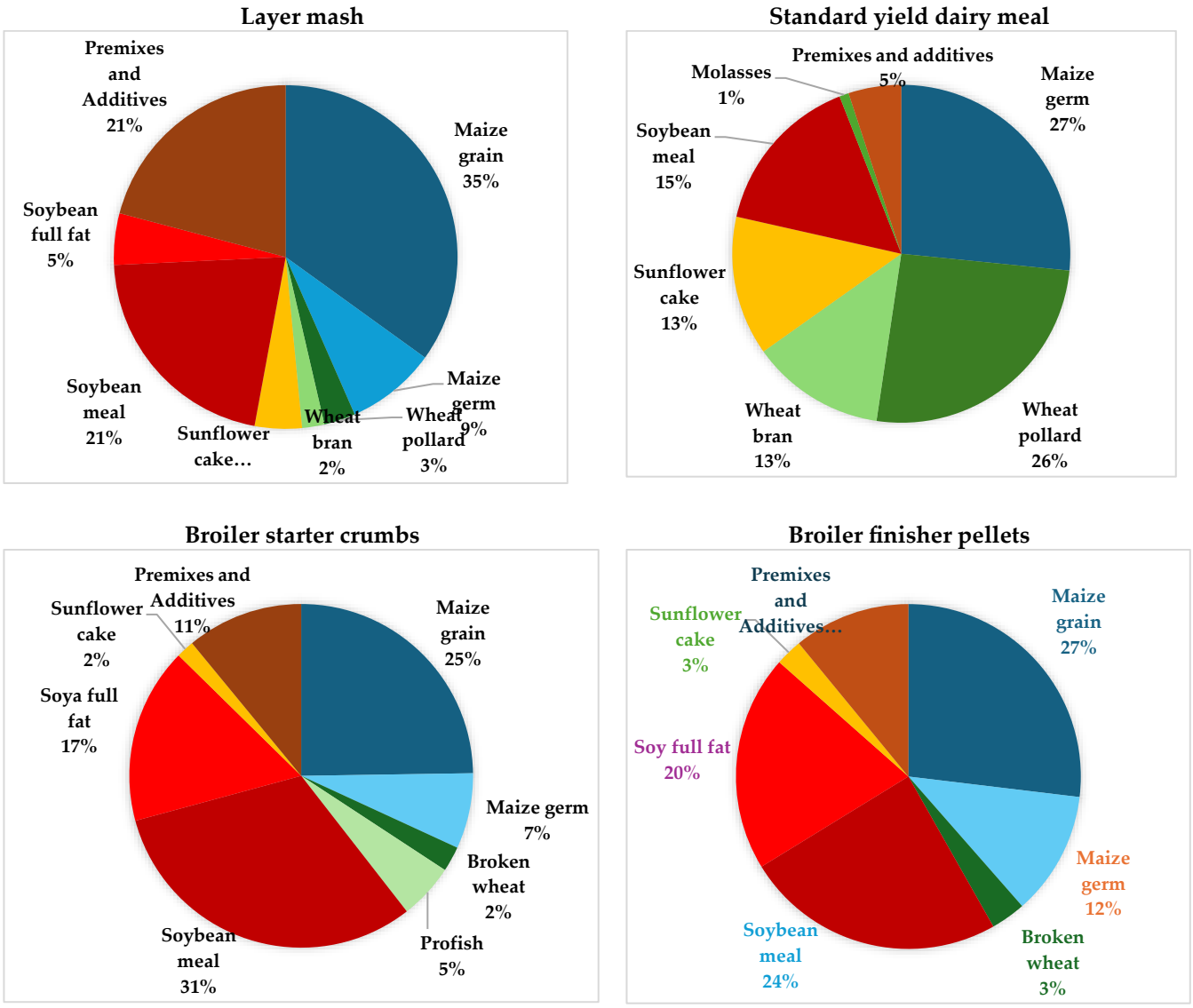
Standard yield dairy



Source: Compiled from RFI data (calculated as a moving 3-month average), feed specifications not shown include grower mash and high-yield dairy meal.

By value, the share of soymeal, soy full fat, and sunflower cake is much higher than by volume, as are the premixes, reflecting their relatively higher prices (Figure 7). The premixes vary substantially from around 5-20% of the input costs by value, depending on the feed specification. For layer mash and dairy meal, the soy and sunflower inputs accounted for around 30% of the total inputs by value in 2022. For broiler starter crumbs and finisher pellets, the soy and sunflower inputs combined accounted for up to 50% of the feed inputs by value. Differences in the prices of these critical inputs have a major impact on the competitiveness of animal feed producers.

Figure 7: Average composition of main animal feeds, by value (for large suppliers), 2022



Source: Compiled from RFI data

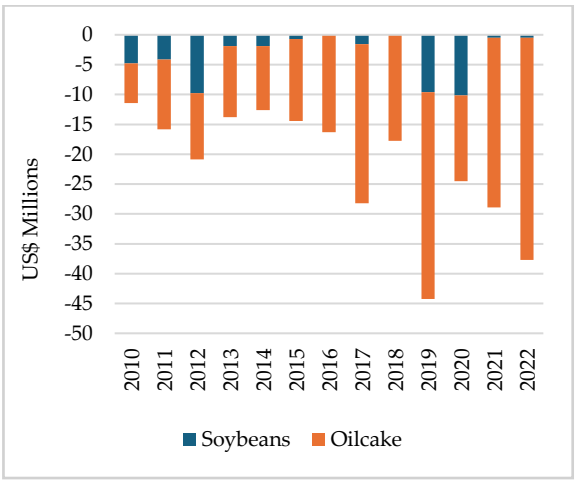
2.3.2 Source of Inputs

Each of the agricultural inputs is sourced differently, from suppliers in Kenya, in regional markets from suppliers across east and southern Africa, and in deep-sea markets. Inputs from milled maize and wheat are mainly sourced from the local milling industry.[26] In the case of wheat, this is a by-product of flour milling. In the case of maize, both milled grains and by-products from milling for human consumption are used in feed. Local maize and wheat dynamics therefore have an impact on the ability of feed producers to source from the local market. For example, the structure of the milling industry, levels of concentration and vertical integration by millers into feed production may impact on the competitiveness of feed production through the ability to source the relevant products.

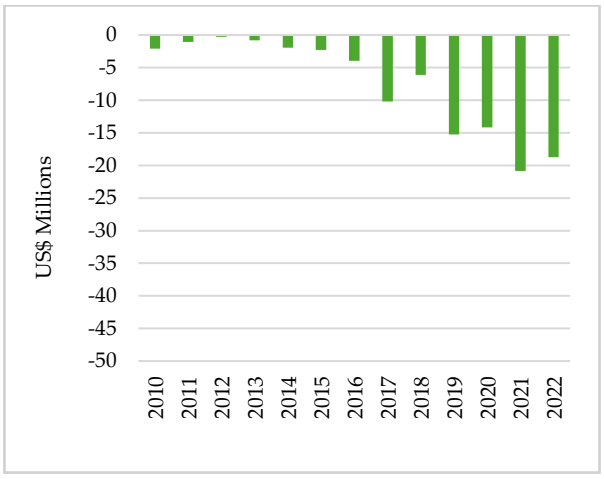
Kenya has very little production of soybean and sunflower. The Kenyan animal feed industry therefore relies heavily on imports of soybean meal and sunflower cake (Figure 8), with imports of both commodities having increased substantially from 2015 to 2022. This in itself illustrates the substantial growth of the animal feeds industry, as the main absorber of these inputs. In the case of soybean, the main product (close to 80% of the bean) is the meal or cake that is used in animal feed with the other product being oil (Kaonga et al., 2023). With sunflower, oil is a more important product, with oilcake as a by-product.

Figure 8: Kenya soybean, meal & cake trade balance (left), Kenya sunflower cake trade balance (right)

8a. Net trade balance soybean and soymeal



8b. Net trade balance, sunflower cake



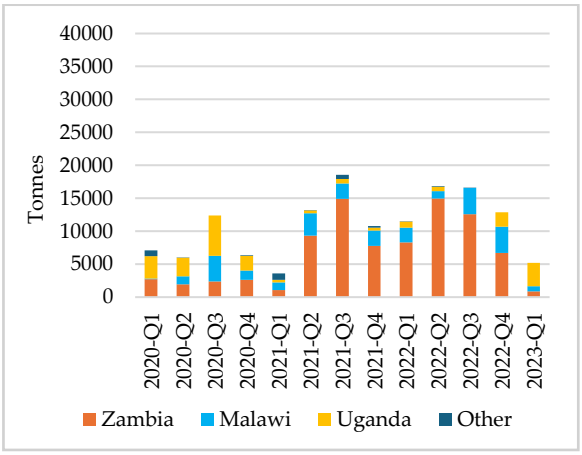
[26] Interview with Firm C, Firm F.

Source: Trademap

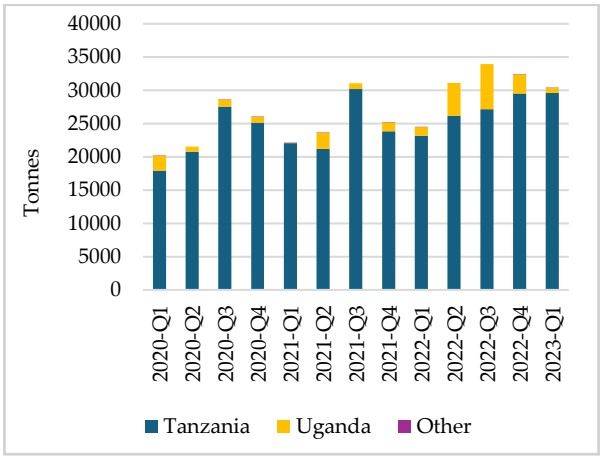
Soybean meal is mainly sourced by Kenya from Malawi, Uganda and Zambia, with Zambia being the largest (Figure 9a). In 2021 and 2022, Zambia accounted for just over 70% of soymeal imports into Kenya, consistent with substantial increases in Zambian production in these years (see Nsomba and Roberts, 2023). The bulk of sunflower cake originates from Tanzania (Figure 9b). As reflected in the volumes of imports, there have been larger volumes of sunflower cake than soymeal (in tonnes), however, the higher price of soybean meal means it is more important in terms of value than sunflower. Prices of the commodities in these markets, along with the related costs to transport them into Kenya, play a critical role in the ability of Kenyan feed producers to compete. As there are no large-scale processors in Kenya, imports are largely of the already processed meal and cake products. Section 5 will consider these trade patterns further.

Figure 9: Kenyan imports by volume, by source country

9a. Soymeal & cake



9b. Sunflower cake



Source: TradeMap

3 Regulatory Framework

This section provides a review of the various regulations, policies, and legislations that impact the Kenya Animal Feed industry and related sectors including product quality, safety, and sustainability, as well as international trade.

3.1 National Livestock Policy, 2020

The policy broadly articulates interventions in livestock nutrition, feeds, and feeding which include measures on the provision of adequate forage resources in various agroecological zones. Further, the policy aims to encourage private institutions, cooperative societies, and other farmer-based groups to undertake concentrate feed milling which in the long run may help ensure the development of standards of feeds, raw materials, and feed ingredients. Mechanisms are put in place to ensure that

manufacturers maintain the required standards to safeguard consumers from hazardous or poor-quality feeds.

3.2 Agricultural Sector Transformation and Growth Strategy, 2019-2029

The ten-year policy aims at developing and transforming the agricultural sector to achieve what was established by Article 43 of the Constitution of Kenya, 2010. The policy focuses on agricultural transformation from small-scale subsistence production into a sustainable, equitable, and remunerative agricultural sector through optimal utilization of quality inputs such as animal feeds. Moreover, the Agriculture Policy 2021 seeks to increase production and productivity in crops, livestock, and fisheries using appropriate, high-quality, and affordable inputs. This policy recognizes animal feed as a farm input.

3.3 Kenya Veterinary Policy 2020

Substandard feeds are a major constraint in the animal resource industry, leading to poor productivity. For this reason, through this policy, the national government will regulate the production and composition of animal feeds and establishments for feed manufacture through:

i. Enhancing the inclusion of health requirements in the production and composition of animal feeds.

ii. Ensuring the approval and registration of establishments for feed manufacture to safeguard animal and human health.

iii. Collaborating with Non-State Actors to provide strategic animal feed and water reserves to mitigate losses in times of scarcity.

iv. Supporting feed subsidies to increase the marketability of animals and animal products.

This policy envisions sustained availability of quality animal feeds in Kenya, not only to the benefit of farmers but also consumers of animal products.

3.4 The Livestock (Animal Feeds) Bill 2023

This provides restrictions and regulatory conditions that govern engagements in any operation of production, manufacture, processing, storage, transport, or distribution of animal feeds. The Bill aims at curtailing unauthorized animal feed handling. The Bill is supportive of the feeds industry to the extent that it will ensure farmers get quality feeds on the premise that only qualified individuals will be involved in the industry.

3.5 Food and Feed Safety Control Coordination Bill, 2023

The policy aims at enhancing food and feed safety standards in Kenya by establishing a coordinated regulatory framework that encompasses ensuring improved safety standards for both food and animal feed products, ensuring that feeds are safe for consumption and do not pose risks to human or animal health. Moreover, the Bill emphasizes quality assurance measures for animal feeds, requiring all the value chain players to adhere to the set guidelines and standards by the regulatory authorities concerned.

3.6. The Biosafety (Import, Export and Transit) Regulations, 2011

These Regulations have the object of ensuring the safe movement of genetically modified organisms (GMOs) in and out of Kenya while protecting human health and the environment. 'Genetically modified organism' (GMO) means an organism that possesses a novel combination of genetic material obtained through the use of modern biotechnology techniques. The Regulations provide that no person shall import or export genetically modified organisms without the written approval of the Biosafety Authority. This applies to the importation of animal feed raw materials including yellow maize, soya beans, and sunflower. It means that Kenya can source non-GMO inputs from countries including Uganda, Tanzania, Malawi, and Zambia but is not able to import from international producers which are GMO producers of the agriculture crops. There is abundant agricultural potential in the region given land and water availability, however, climate change has meant more variable weather conditions.

Kenya remains at a crossroads in as far as GMOs are concerned. Even though a framework for their regulation exists, the framework has generally not been put to test within the ambits of open growing and importation of animal feeds and food crops. The adoption of GMOs has been widely challenged and continues to be debated extensively within the food security policy arena. Equally, Kenya has a national divide regarding the application of GMO technology as well as the importation of both animal feed raw materials and food crops that have been genetically modified.

Despite Kenya having a robust policy framework to regulate trade in animal feed products and raw materials, the country has continued to experience challenges with importing at reasonable prices from its neighbouring countries.

3.7. Non-tariff barriers and regulation of trade including those relating to aflatoxin

Non-tariff barriers have impacted trade, especially in maize. Restrictions imposed on Kenya by Tanzania on maize exports in 2022/23 saw the volume of maize imported from Tanzania decline from over 7000 thousand tonnes in 2021/22 to around 400 thousand tonnes in 2022/2023. Maize exporters

to Kenya were required to obtain export certificates.[27] This exacerbated the maize grain shortage in Kenya.

International trade in agricultural products also requires consistent application of appropriate sanitary and phytosanitary (SPS) measures. This is one of the key areas of cooperation spelt out in the East Africa Community (EAC) Treaty. Specifically, Article 108 (c) of the Treaty and Article 38 of the Protocol on the Establishment of the East African Community Customs Union provide for the Partner States to harmonize SPS measures to facilitate trade within the community and other trading partners. Further, the Treaty provides for cooperation in Agriculture and Food Security and calls for an effective regime of SPS measures, standards, and technical regulations in the region.

Regulations on aflatoxin control were developed on the appreciation that a wide range of crops are susceptible to aflatoxin contamination in the EAC including maize, sorghum, millet, rice wheat, oil seeds such as groundnuts, cottonseed, and sesame. The EAC has set the maximum limit of allowable aflatoxin at 10 parts per billion for major grains including maize[28]. Aflatoxins can be highly toxic to animals as well as humans. When contaminated grain or feed is ingested by an animal, the toxin can also contaminate the meat, eggs, and milk produced, which can then infect the people who consume it.

Despite the regulations being in place, incidences of high aflatoxin levels have over the years been reported in Kenya, particularly in maize imports.[29] The reported incidences of aflatoxin are due to limited testing infrastructure and enforcement of the standard particularly at points of entry of maize from Uganda and Tanzania. This is exacerbated by the failure of farmers to adopt good agricultural practices that would ensure food has the right moisture content to eliminate aflatoxin and the shortage of laboratories for testing aflatoxin[30]. Kenya being a net importer of maize is worst hit by non-adherence to aflatoxin standards in the EAC region and this is a key area for action to improve competitive regional markets for feed inputs.

3.8. Agricultural Produce Cess and levies

The Constitution of Kenya (CoK), 2010 recognizes the need for county governments in Kenya to have reliable Article 175 (b) revenue sources to ensure effective governance and delivery of public services, underscoring the principle of devolution. Further, Article 209(3)(c) allows Counties to impose additional taxes provided it is sanctioned by an Act of Parliament. Article 209 (4) empowers both the national and the county governments to raise revenue by imposing licenses, fees and charges on

[27] https://www.thecitizen.co.tz/tanzania/news/east-africa-news/kenya-loses-42pc-of-tanzania-maize-imports-4598836
[28] East Africa Community Aflatoxin Prevention and Control Strategy, Action Plan and Result Framework: 2018-2023
[29] Interview with Firm E.
[30] https://www.parliament.go.ug/news/6946/trade-ministry-sets-measures-combat-aflatoxin-contamination

services provided within their jurisdiction. The CoK gives limitations to these powers to impose taxes in Article 209(5) whereby, they are to ensure that the taxation and any other revenue-raising measures do not prejudice national economic policies, *economic activities across county boundaries, factor mobility and trade* [emphasis added].

The Crops Act, 2013 makes a distinction between taxes that can be imposed by the National and County governments concerning Agricultural Produce, in furtherance to the fourth schedule of the CoK. It provides that "counties may impose fees for development of crops within the county; development and regulation of scheduled crop markets within the county; issuance of trade licenses to any person trading in scheduled crops within the county; and issuance of licenses for cooperative societies dealing with scheduled crops within the county". In consistency to the limitations in the CoK when imposing taxes, the crops Act Section 17(3) provides that "the fees imposed by a County government under subsection (2) shall not in any way prejudice National economic policies, *economic activities across County boundaries or National mobility of goods, services, capital or labour*".

Agriculture, Fisheries and Food Authority (AFFA) Act, 2013, section 4(e) mandates AFFA to advise the national government and the county governments on agricultural and aquatic levies for purposes of planning, enhancing harmony and equity in the sector. Similarly, the Intergovernmental Relations Act Section (5) provides a platform for coordination and cooperation between levels of Government the basis for facilitating the realization of the objects and principles of devolution provided for under Articles 174 and 175 of the Constitution, on revenues.

The taxes imposed by county governments through their respective County Finance Acts are Agriculture Produce cess and Market cess or Landing Fees, which may be imposed on goods coming into, out of or through the county. Agriculture produces cess is applied to commercially produced and or supplied agricultural inputs and products, while Market cess or landing fees are imposed on agricultural inputs and commodities for crops and livestock that are sourced from other counties and are landed in the given county for processing or sale, this includes animal feeds. In some instances, some counties have agreements between their administrations for mutual recognition of cess payment and thus, some counties may waive additional charges for goods passing through their jurisdiction, upon evidence of cess payment in the county of origin. In cases where there are no mutual recognition agreements between counties, manufacturers transiting or trading face double taxation. In addition to these, branded vehicles face additional cess charges when transiting from the county of origin to the destination county regardless of levies already paid at the county of origin (See interview with Firm I).

It is worth noting that there is no standard unit of measurement used in the imposition of agriculture produce cess and levies as some counties may charge based on vehicle tonnage, package sizes, per consignment, and type of vehicle. In essence, the varied units of measure in the taxes imposed contravene the principles of equitability and neutrality in taxation as envisioned by the CoK.

For instance, animal feed manufacturers who are mainly based in Nairobi source maize and its by-products from producing counties such as Nyandarua, Nakuru and Uasin Gishu, and must transit through Kiambu county, to reach Nairobi. The county government of Kiambu in its Finance Act Section 26 (3) provides that "A person transporting agricultural products *from, into or through the County* shall be charged the fee [.]" Essentially, any manufacturer who has to transit goods through Kiambu may face higher prices of maize inputs in comparison to those who do not transit through the county.

Manufacturers of animal feeds face several levies during the transportation and distribution of their products. For example,[31] Machakos County charges Ksh. 20,000 (US$155) per vehicle annually for distribution. Additionally, there is a yearly fee of Ksh20,000 (US$155) for branding, which the county views as a form of advertising, applicable for a 10-ton truck. Manufacturers also pay an annual transportation sticker fee of Ksh. 2,500 (US$19.38) per vehicle for transporting goods into, out of, or within the county. Moreover, there is a daily parking fee of Ksh. 500 (US$3.88) per vehicle.

On the input side, manufacturers incur Agricultural Produce Cess based on the county from which they source their feed. For instance, one manufacturer pays Ksh. 100 per tonne for cattle salt and Ksh. 100 per tonne for rice polish in Kajiado County, both of which are inputs in animal feed manufacturing. These charges can vary significantly depending on the county.

For example, Kericho County, which comprises six sub-counties, charges Ksh. 200 in parking fees per vehicle per sub-county visited each day. Thus, if a manufacturer is supplying animal feed to all six sub-counties, they may pay at least Ksh. 1,200 per day per vehicle. In contrast, counties like Tharaka Nithi require manufacturers to pay annual parking fees at the beginning of the year for all vehicles owned by the manufacturer, regardless of how many trips are made to the county throughout the year.

Overall, these varying charges create an unpredictable regulatory environment for manufacturers and contribute to a lack of equitable taxation at the county level, as it depends on the number of counties a manufacturer supplies feed to or sources inputs from. The cost of sourcing feed inputs and supplying various counties with the finished animal feed product is inequitable, significantly impacting the transportation and distribution expenses incurred by manufacturers. Issues such as double taxation, the lack of mutual recognition of agricultural produce fees, inconsistent units of measurement for imposed taxes, multiple distribution licenses required by different counties, and various vehicle branding fees in each county contribute to higher overall transportation and

[31] Interview with Firm I.

distribution costs. As a result, manufacturers face an 'uneven playing field' caused by regulation at the county level.

3.9. Taxation Policies on Animal Feeds

Animal feeds in Kenya for the longest time have been subjected to 16% Value Added Tax (VAT) and import duty on raw materials/ inputs imports. However, from July 2018, the Government through a budget statement in June 2018, removed VAT on animal feed inputs[32]. This was informed by the fact that more than 50% of the feed inputs were imported from the East African region, the prices of which have been increasing rapidly depending on supply-demand dynamics and weather patterns. This move was to cushion the sector players by saving them a total of 16% of the overall cost of raw materials.

Further in August 2021, the Government, through the National Treasury waived import duty on seven imported raw materials used in the manufacture of animal feeds. This was intended to trickle down to farmers and benefit them in the form of reduced feed prices. However, feed prices have continued to rise over the years. The waiver had a sunset period of one year and applied to raw materials including yellow maize, soya bean meal, cotton seed cake, white sorghum, fish meal and sunflower cake sourced from the East Africa region.

In addition, the Kenyan Government in August 2023, approved zero rating on imported raw materials for manufacturing animal feeds[33]. However, a major concern is that it has not lowered the cost of animal feeds as was envisioned.

[32] Republic of Kenya (2018). The National Treasury Medium Term 2018 Budget Policy Statement

[33] https://farmbizafrica.com/removal-of-vat-from-animal-feeds-ingredients-by-the-government-relief-to-farmers-and-investors/?option=com_content&view=article&id=1652&catid=10

4. Feed markets and price analysis

4.1. Product markets and main suppliers

4.1.1. Market Definition Overview

Market definition involves considering the close substitutes (or good alternatives) to buyers in terms of product characteristics and geographic sources of supply. This is captured in the hypothetical monopolist test which considers consumer switching in response to a Small but Significant Non-transitory Increase in Price (or SSNIP) test.[34] Market definition can also involve considering supply-side substitutability, although jurisdictions differ on whether this is taken into account in the market definition process itself or as a separate step.

For a market inquiry, we are mapping out markets to understand the market structure and consider factors that may be lessening, preventing, or distorting competition.[35] This takes into account changes in the markets over time, including factors such as entry barriers and the evolution of producers' operations. We therefore include demand-side and supply-side factors in this section.

There are many different feed specifications. The specifications are important for buyers who wish to optimize performance at the least cost. Buyers do not readily switch to feed formulated for another animal in the event of a price increase. Some specifications vary to a lesser degree, such as for broiler mash and broiler pellets, and in terms of formulations of the same core constituents for the starter, grower, and finisher phases of broiler poultry production.

4.1.2. Relative prices

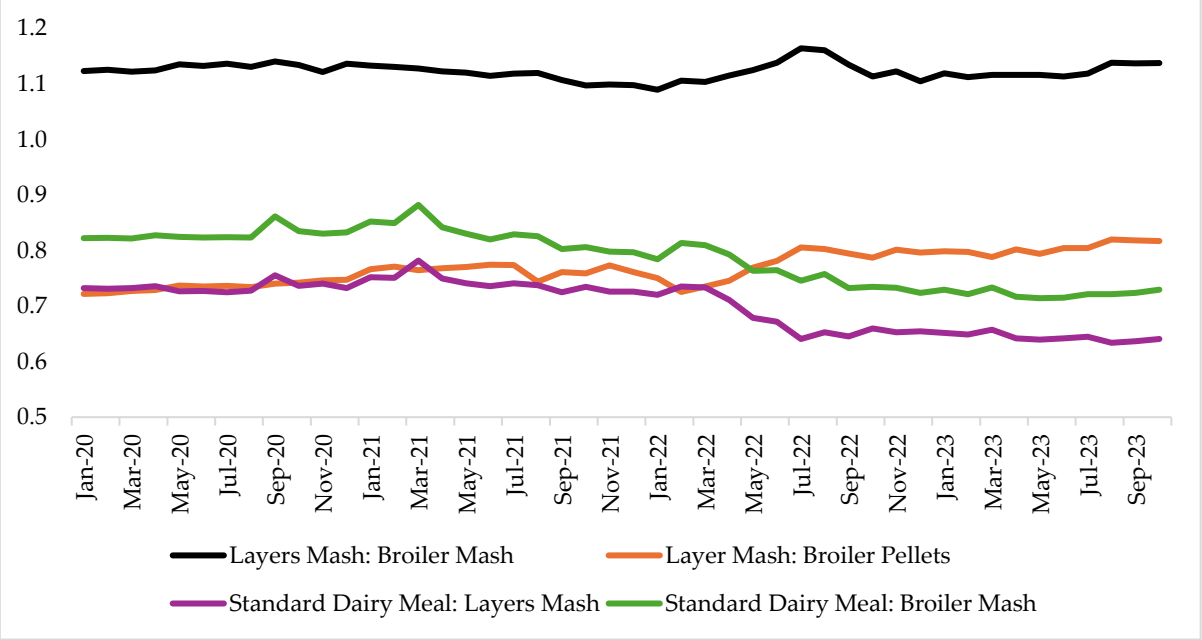
Prices for the main feed categories range from Standard Dairy Meal which is the cheapest of the main categories, to Broiler Finisher Pellets which is the most expensive (Figure 3 above). Comparing dairy meal to layer mash we can see a difference of around 25-35% (Figure 10). Feed prices increased sharply across the whole range from mid-2021 to mid-2022.

We consider changes in relative prices over time as part of assessing whether buyer switching would discipline price increases for one relative to the other, noting that the common constituents mean that prices of feeds will be likely to change in similar ways due to cost factors. The relative prices have changed substantially between dairy meal and poultry feeds (for layers and broilers), as the poultry feeds became relatively more expensive. In poultry feed, the ratio between layer mash and broiler

[34] As set out in the guidelines of competition authorities around the world and see recommended practices of the International Competition Network.
[35] See Motta, Peitz, Schweitzer (eds) (2021).

mash has been relatively stable with layer mash around 10-15% more expensive than broiler mash over the period 2020 to 2023 (Figure 10).

Figure 10: Price ratios for main feed categories



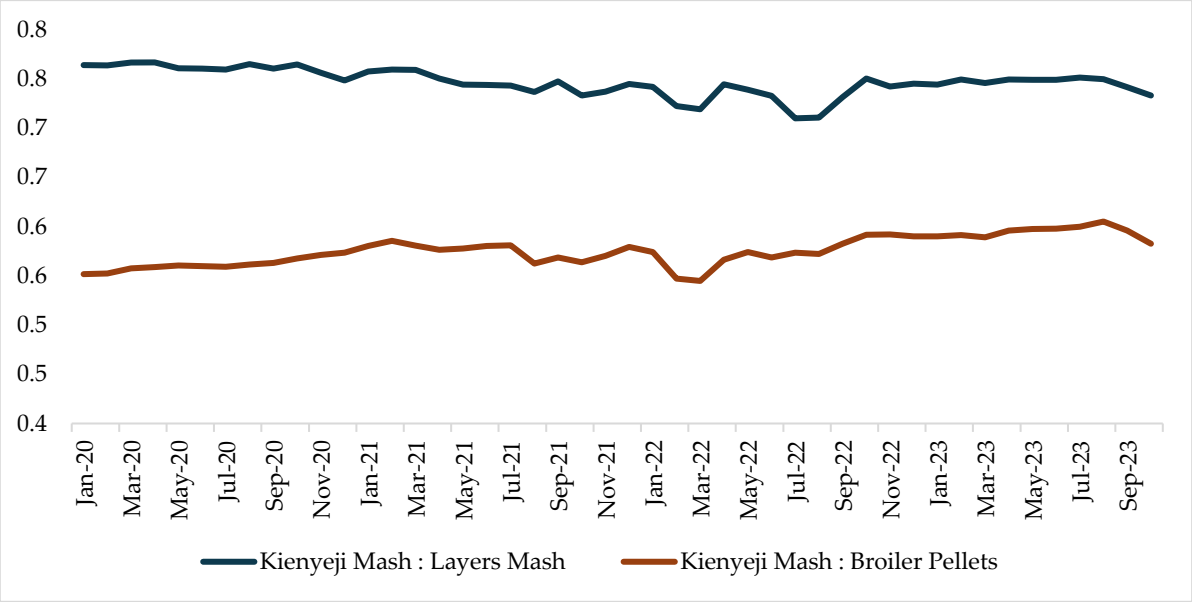
Source: Author's computation from RFIs

Buyers do not readily switch to feed formulated for another animal. If dairy feed had been a good substitute for poultry feed, then poultry farmers would have switched from poultry feed to dairy feed, and the companies could not have sustained the relative price increase. This confirms the information from interviews that dairy and poultry feed are in different product markets.

We further understand that notwithstanding broadly similar constituents (see Figure 4 above), the performance differences mean that buyers will not readily switch from broiler feed to layer feed if they are raising broiler chickens, and layer feed reduces in price.

There are also big differences in the prices of feed for *k* chickens and for broilers and layers (Figure 11), and these are likely to be distinct market segments. The performance expectations are also quite different. *kienyeji* refers to chickens that have been bred to both produce eggs and to be slaughtered for their meat after some time. The birds are suited for foraging, including varied sources of feed, and not for intensive egg production or rearing for meat. This is reflected in the quite different feed formulations and prices charged. For example, broiler pellets have been in the order of 50-70% higher than *kienyeji* mash, with layer mash in between (Figure 11).

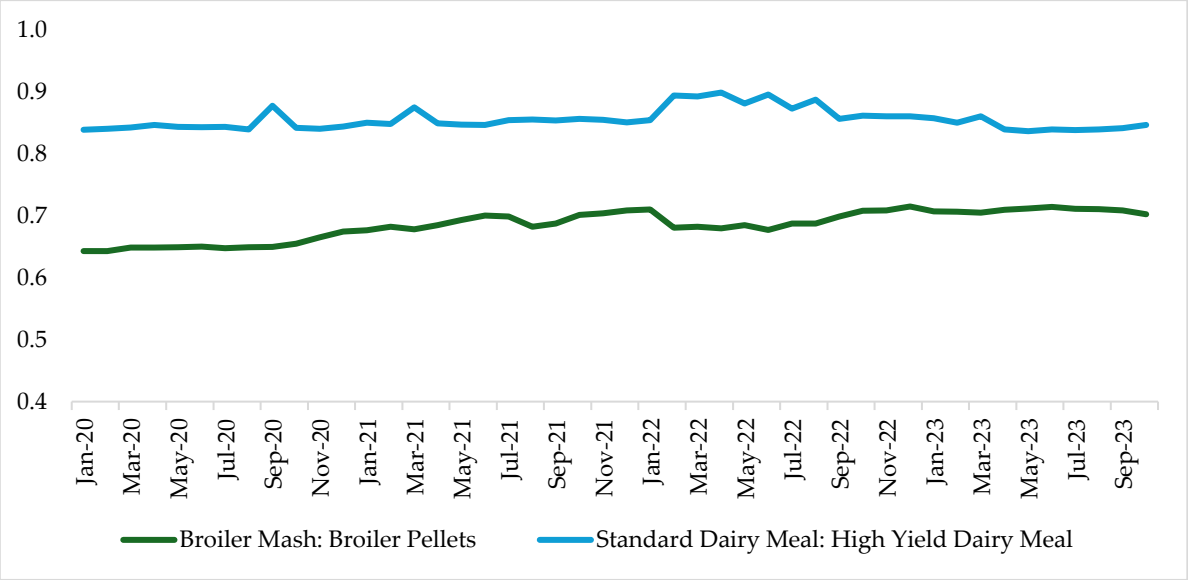
Figure 11: Prices for Kienyeji feed compared to layer mash and broiler pellets



Source: Author's computation from RFIs

Within broiler poultry and dairy feed, there could be substitutability between different feed specifications. A broiler chicken producer can choose between using mash or using pellets (including crumbs at the starter phase). Broiler pellets are produced in a cooking process that aids the combining of the constituents and the digestion by birds, which improves performance. For the feed producer, it requires investment in different machinery to produce, and there are fewer producers of pellets than of mash. Broiler pellets are priced higher than mash, with broiler mash prices being between 64-72% of the price of pellets (Figure 12). There are also different specifications of dairy meals with high-yield dairy meals being more expensive than the standard specifications.

Figure 12: Price ratios for specifications of dairy and broiler feed



Source: Author's computations from RFIs.

4.1.3. Company product mixes and supply-side substitutability

Most firms supply poultry and dairy feeds since these are the largest categories of feed used in Kenya. In other feed categories there tend to be fewer firms. Companies making a portfolio of feeds can switch between the different feeds meaning that there is a degree of supply-side substitutability between feeds for different animals. This depends on being able to source the necessary inputs and on having an established position and distribution network in the different feeds.

As with many products, companies brand and market their feeds with various claims regarding the specific benefits of the product to the customer's animals. While there may be a small premium for feeds that are perceived to be at the top of the range due to brand and marketing, we understand that the main feed producers make broadly homogenous feeds within each of the main specifications.

4.1.4. Initial assessment

Based on the available data we find that there are separate product markets for the feed specifications for different animals. There are also separate product markets within poultry for layer, broiler feed (with segments for crumbs/pellets and mash), and *kienyeji* feed. Within dairy, there may be separate segments for standard and high-yield feeds.

Supply-side substitutability motivates a wider market for the main animal feeds, noting the different production machinery required for producing pelletized feed.

4.2. Geographic markets

Geographical markets are defined in the same way as product markets. Demand-side substitution involves the possibility of consumers switching to source animal feed from different geographically located suppliers. The ability of producers and consumers to shift from their given area to supply or source feed is largely influenced by the relative cost of doing so considered against the price differences. Transport costs are relevant, along with factors such as county regulations. The main geographic areas of production and consumption are described first before considering how to define geographic markets.

4.2.1. Overview of main geographic areas of feed production and consumption

Identifying areas with intensive commercial farming areas in Kenya is key to identifying key geographical markets for feed as they are the main feed demand regions. Central Kenya, encompassing the highlands, is renowned for its intensive commercial dairy farming, including counties like Kiambu, Murang'a, and Nyeri (Figure 13). Similarly, Rift Valley regions like Nakuru, Uasin Gishu, and Bomet are known for intensive dairy and poultry farming. Eastern regions such as Embu, Meru, and Machakos specialize in intensive commercial dairy and poultry farming, while coastal regions like Kilifi and Kwale are known for poultry farming. Additionally, the Nairobi region and its environs have a concentration of dairy, poultry, and other livestock farms for commercial purposes. These regions, with their intensive commercial livestock farming, are likely the primary demand regions for animal feed.

Figure 13: Counties of Kenya

Source: Getty Images

Demand for animal feed, particularly for poultry and dairy, can be broadly grouped into three regions (as in Chapter 2 above), each potentially containing sub-markets:

- The Central and Northern regions (including Nairobi and its environs, Kiambu, Murang'a, Nyeri, Kirinyaga, and Tharaka Nithi),
- The Western and parts of the Rift Valley regions (encompassing Nakuru, Uasin Gishu, Bomet, Kericho, Kisumu, Kakamega, Kisii, Homabay, Busia, and Migori counties), and
- The Coastal and parts of Eastern regions (covering Mombasa, Kilifi, Taita Taveta, Kwale, Makueni, Machakos, and Kajiado).

On the supply side of the animal feed industry, most medium to large-sized companies are based in Nairobi and its environs. [redacted] Although some companies may have milling facilities in multiple locations[36], it is not common. Other smaller animal feed manufacturing companies are spread out across the main areas of feed demand.

These companies distribute their animal feeds to the aforementioned counties through a network of distributors categorized as either retailers or distributors based on sales volume. Typically, animal feed companies prefer selling products to distributors for efficiency reasons. Distributors can either pick up feed from main plants or request delivery to their specific location. Manufacturers often offer transport discounts based on distributor location and purchase volume, allowing for variable pricing in different geographical areas. Many large-sized to medium-sized animal feed companies discourage distributors from competing outside their main region.[37]

Certain geographical locations, such as Thika, Mombasa, and Nakuru counties, are recognized as hubs for the supply of imported concentrates.

4.2.2. Defining geographic markets

To delineate geographical markets within the animal feed industry in Kenya, we consider the prices of feed products in different locations, relative to transport costs and sources of supply. If suppliers in one area increase the price (as if they operated as a hypothetical monopolist which imposed a small but significant non-transitory increase in price or SSNIP) then we assess whether customers would switch to alternative sources of supply from other locations further afield after taking into account the relative prices and transport costs. If a substantial proportion of customer demand switches to alternative supply, then the price increase would not be profitable and it indicates that the relevant market extends beyond the initial geographic area. The aim of the SSNIP test in the context of animal feed markets in Kenya is to identify the smallest geographic area where a hypothetical monopolist could sustain higher-than-competitive prices for animal feed products. Essentially, this assesses the ease of demand-side substitutability in the animal feed markets.

Given the various types and forms of feeds as described in section 2.2, the application of the SSNIP test will vary depending on the volumes of feed being purchased, the type and form of feed being procured and the regulations affecting feed in the relevant counties in the geographical regions under consideration.

For instance, poultry feed in the form of pellets is relatively pricey compared to mash feed forms. Conversely, it may be relatively less costly for a large consumer to source from outside of their region

[36] In the case of [redacted].
[37] Interview with Firm D.

since they may get discounts on transport costs based on volumes purchased. Further, in the assessment of relative prices, it was noted that Government regulations may increase the relative price of a good in one geographical market to another.

In the case of Kenya, Article 209 (3) of the Constitution grants county governments the Authority to generate their local revenue through imposition of taxes and charges. These levies may vary across counties, however, the common allowable levies that affect animal feed transportation costs include cess[38], advertising, parking fees, and business permits, among others which are enacted through the county Finance Acts for the respective county. Feed suppliers indicate that counties such as Tharaka Nithi, Makueni, and Machakos have relatively higher fees which affect the cost of doing business in these regions.

In practice, if a distributor chooses to collect the feed directly from the manufacturer, it is common for the manufacturer to offer a discount on their price list based on the distance travelled. Notably, in the case of Mombasa, we observed a variation in transport costs due to its location along a major regional transport route, the northern transport corridor.[39] Consequently, Mombasa benefits from lower transport prices from trucks returning along the northern transport corridor in comparison to areas such as Meru which have comparable distances from manufacturers' hubs like Nairobi.

Transport cost estimates

For distances up to 50 km, transportation costs are typically included in the feed price. However, for distances beyond 50 km, additional fees apply, ranging from around Ksh. 100-150 per 50kg bag per 100 km (Table 2).

The relative importance of transport costs depends on the feed being considered as prices have ranged between Ksh. 1,500 to Ksh. 4,000 per bag (Figure 6, above). The transport costs between different locations within the three regions (namely the Central and Northern region; the Western and parts of Rift Valley; and the Coastal and Eastern regions), maybe 5-10% and more for the cheaper feeds such as dairy and *kienyeji* feed. However, the transport costs are at least partially taken into account in the relative prices being charged and we do not consider there to be narrower geographic markets within each of these broad regions. For instance, Machakos, which specializes in commercial poultry farming, and Mombasa, which is a hub for poultry feed, are within the same broad market, the Coast & Eastern Region.

[38] Cess fees are a type of taxation imposed by county governments on goods during their transportation across county borders

[39] Interview with Firm A.

Table 2: Transportation costs relative to the pricing of layers mash

Scenario	**Transportation cost (Ksh/bag)**	*Impact*
Nakuru – Thika (166km)	+150	Farms in the Western and parts of the Rift Valley region (Nakuru) sourcing layers mash from the Central and Northern region (Thika) would see a roughly 5% increase in relative price.
Kisumu – Thika (348km)	+300-400	Farms in the further parts of the Western region sourcing from Thika would see a roughly 10% increase in prices.
Thika – Mombasa (524km)	+500-750	Farms in the Central and Northern regions (Thika) sourcing layers mash from the Coastal and parts of the Eastern regions (Mombasa) would experience a significant 25% increase in relative price.

Source: Interviews and Table A1

We consider whether the three main regions are separate geographic markets or maybe one or two larger geographic markets. We note, however, that the incomplete responses to data requests make it difficult to make a clear finding on this.

Are the Western, Rift Valley, Central, and Northern regions in the same geographic market?

Given the different locations of feed buyers within these regions, it is not straightforward. The closer locations in the Western & Rift Valley to the Central region, represented by Nakuru are around 166 km from the main feed suppliers in Thika. This translates into transport costs which are around 5% of the feed price (Table 2). Further locations such as Kisumu have correspondingly higher transport costs, which may mean that local feed suppliers have a degree of market power if they act together. Interviews in the area indicated that they may be able to access feed from Busia, a county that borders Uganda. We therefore consider that there may be a separate geographic market in the Western Region, especially for the cheaper feed specifications (where transport costs are relatively more significant).

Is the Coastal & Eastern Region a separate geographic market?

The distance from the main Central Region feed suppliers in Thika to the main sources of demand and also of feed suppliers in the Coastal and Eastern region in and around Mombasa is significant at 524km and a transport cost per bag of over Ksh. 700/bag (Table 2). This means that prices in the

Coastal region could increase by well over 10% before customers would consider transporting from suppliers in the Central region.[40]

We recognize that there are a range of estimates from different sources depending on the scale of transporting, and whether the company has their own transport. We are focused more on smaller customers who would have to source using third-party transporters.

We see the implications of the transport costs reflected in pricing by firms to different geographic areas. Manufacturers often offer transport discounts based on distributor location and purchase volume, allowing for variable pricing in different geographical areas.

Company geographic focus

When assessing the geographical focus of animal feed manufacturing companies, it is important to note that some companies have a national focus and supply their products to multiple regions, while others have a regional focus and only supply feed in a specific region. This means that companies with a regional focus compete with national companies within their specific geographical region.

In the Central & Northern Region, there are the major national suppliers along with large regional companies, namely [redacted]. Their presence spans across Nairobi & Environs, Kiambu, Nairobi (Industrial Area-Embakasi), Thika, Murang'a, Nyeri, Ruiru, Karatina, Kirinyaga, and Tharaka Nithi, including surrounding areas.

Similarly, in the Western & Rift Valley Region, the major national producers have established a strong foothold. They operate in counties such as Nakuru, Eldoret, Molo, Olenguruone, Bomet, Sotik, Ravine, Kericho, Kitale, Kisumu, Kakamega, Kisii, Homabay, Siaya, Migori, Busia, and surrounding areas, catering to the flourishing livestock farming communities in the region. This reinforces the likelihood that Western, Rift, Central, and Northern are in one wider geographic market.

In the Coast & Eastern Region, the national-level producers supply alongside local producers in counties including Mombasa, Kilifi, Taita Taveta, Malindi, Likoni, Machakos, Kitui, Makueni, and Kajiado, along with surrounding areas.

4.2.3. Assessment

The geographical market for animal feed in Kenya is shaped by various factors including transportation costs, regional agricultural practices, and government regulations among others. We find that the Western and parts of the Rift Valley, Central and Northern, and Coastal and parts of the

[40] We note that some large companies with transport operations reported costs from Thika to Mombasa of Ksh250/bag, but it is unlikely that customers would be able to get these transport costs if they were subject to a localized SSNIP.

Eastern regions are distinct markets within the animal feed industry, based on transportation expenses.

4.3. Concentration in feed

Inadequate responses from several companies hampered our ability to measure concentration for the relevant product and geographic markets. We have therefore relied on interviews and available data to estimate animal feed capacity and sales for each of the main companies, along with a breakdown by the main feed categories and regions supplied (Appendix Table A2).

While the Coastal and Eastern Region may be a separate geographic market, we do not have the data required to calculate concentration ratios for it. Nor are we able to calculate separate ratios for *kienyeji* feed even though it may be a separate product category.

We estimate that the total production of large and medium commercial producers (those with capacity, although not necessarily actual production, of one thousand tonnes per month, tpm, or more) to be around 50 thousand tonnes per month (or around 600 thousand tonnes per annum).[41] Within the commercial feed suppliers, there are two very large companies with national supply, internationally connected with capacities of more than 15th tpm. There are around seven large suppliers, which are quasi-national or with a strong regional reach, with capacities around 4-8th tpm. There are then several medium/small suppliers with capacities of 1-4th tpm. These companies collectively account for close to 90% of the formal commercial feed supply in Kenya.

We estimate that the top four (4) companies account for well over 50% of commercial feed sales. However, we are not able to assess concentration by sub-national markets (in the three main supply regions), and by sub-groupings in animal feed. Although we anticipate, they are likely to be more concentrated. For example, in commercial poultry feed and dairy feeds separately we estimate that the top four companies account for around 75% of national supply (Figures 14 and 15).

4.4. Barriers to entry in feed

Entry barriers differ between animal feed categories. If the feed is simply manufactured by mixing different ingredients, then low levels of investment are required. Supplying higher specification feed requires more sophisticated capabilities. In addition, there are barriers to being an effective competitor in terms of being able to consistently access inputs. New entrants also need to establish relationships with networks of distributors.

[41] Including all small-scale and informal feed suppliers the production would be higher (see, for example, interview with Firm A).

Barriers to entry for dairy feed are relatively lower as the feed is supplied as a meal that is mechanically mixed. The constituents can be altered to produce high-yield and super-high-yield dairy meals. Some dairy farmers also source constituents themselves along with vitamins and minerals to mix their feeds. In poultry feed, the specifications are more exacting. In addition, feed in the form of crumbs and pellets also requires investments in appropriate machinery, which investments have been made by a growing number of feed producers. Sourcing soymeal and sunflower cake from the concentrated crushing industry is an issue we explore below.

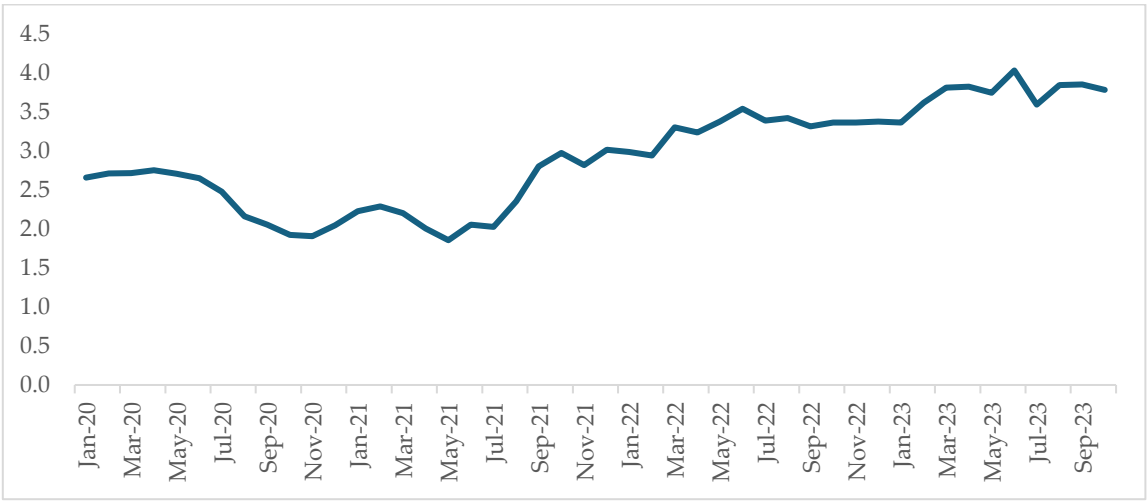
5. Feed inputs markets and price analysis

5.1. Defining product markets for inputs

As discussed in Section 2, the different feed specifications require differing combinations of the inputs to provide the nutritional characteristics required. Inputs providing protein and energy are complements. We consider whether the main alternatives to provide energy and protein are themselves in different product markets. As explained in section 2.3, products of maize and wheat are important sources of energy while soybean meal and sunflower cake are the main sources of protein.

We observe that the prices of the protein inputs show that they do not impose a competitive constraint on each other. Price differences vary by more than 5-10% which would be applied through a SSNIP test. In particular, the soymeal price almost doubled from 2020 to mid-2021 and remained at elevated levels. The relative price of soymeal to sunflower cake also increased substantially (Figure 16). This indicates that these inputs are not good substitutes, at least for the feeds that require high levels of protein and lower levels of fibre, such as broiler feed.

Figure 14: Average price ratio of soybean meal to sunflower cake



Source: Calculation based on RFIs, the average across feed companies

Interviews confirmed that feed producers do not perceive soybean meal and sunflower as good alternatives. Sunflower contains less protein than soybean meal and is also higher in fibre. This is

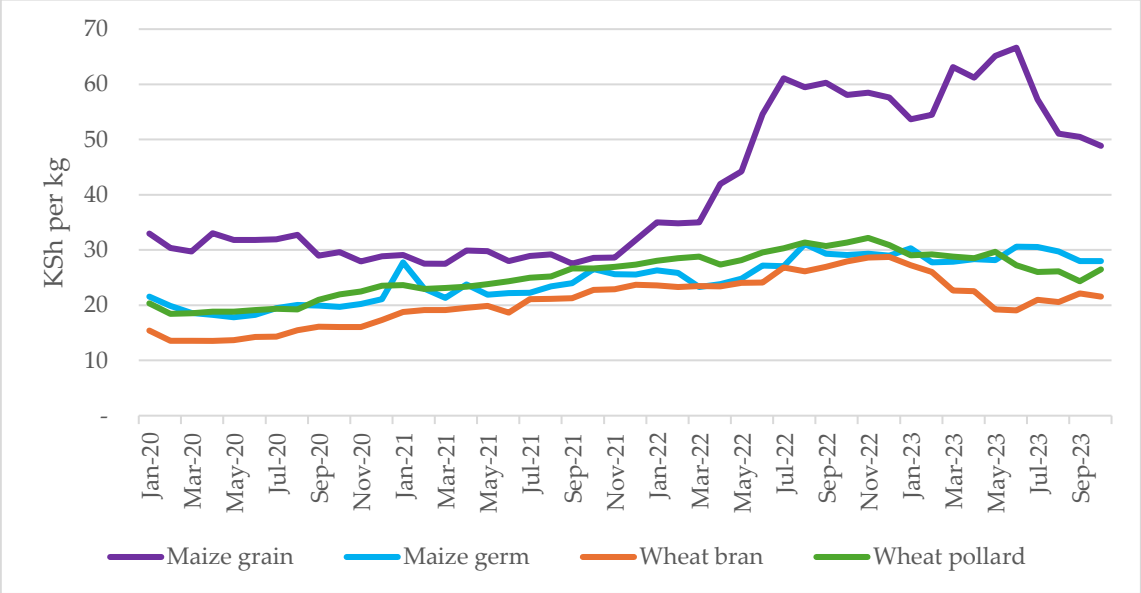
particularly an issue for broiler production, and so using more sunflower than soybean meal in broiler feeds results in the feed performing poorly.[42]

While feed companies attempted to use somewhat less soymeal in response to higher prices, their ability to substitute away from it was severely limited and soymeal remained the most important protein source overall. This implies that suppliers of soymeal would collectively have a significant degree of market power.

We consider the possibility of switching between energy sources, namely, maize and its by-products and wheat by-products. Maize and wheat products are sourced locally from the millers in Kenya, which includes some millers which are vertically integrated with feed producers. The wheat by-products are priced at similar levels, albeit with variations over the period, and from a manufacturing perspective, there are no significant production differences in obtaining the wheat pollard versus wheat bran. We understand that feed producers do source as much as is available, with supply being constrained by the demand for flour. The bulk of energy requirements for feed are met from maize grain being milled (in addition to maize by-products). The substantial increase in maize prices in mid-2022 was not constrained by wheat by-products, clearly indicating a separate product market for maize for animal feed (Figure 17). In addition, the price of maize grain increased significantly relative to maize germ meaning that companies' substitutability between these inputs was also limited (Figures 17 and 18). Wheat bran and wheat pollard have had more stable relative prices.

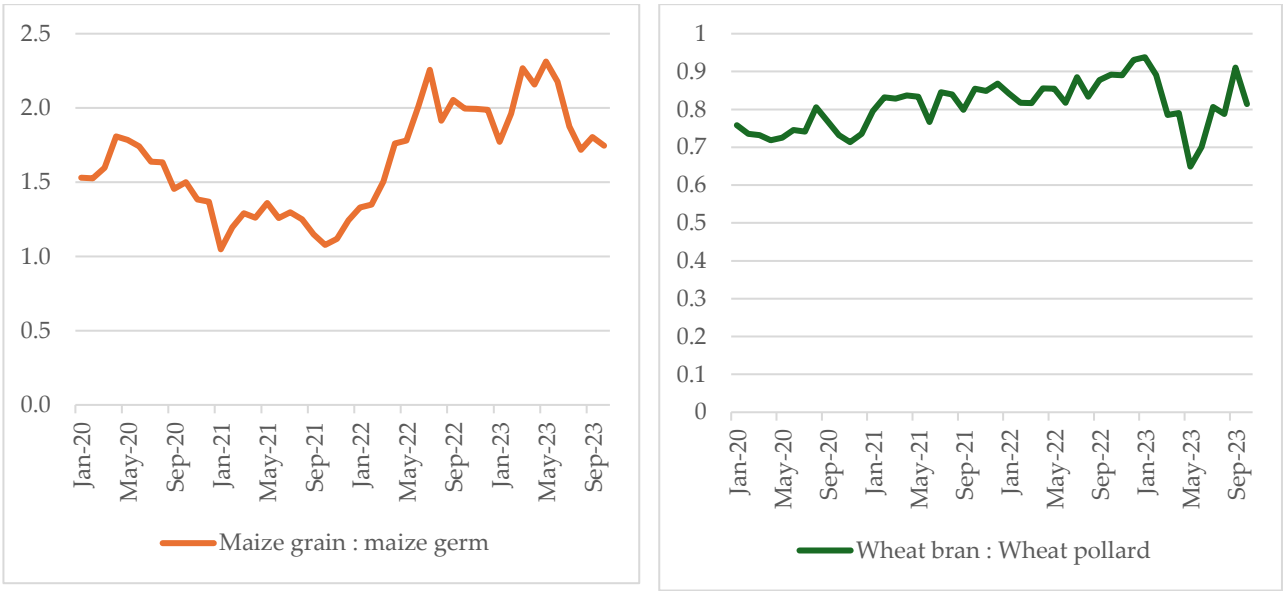
[42] Interview with Firm C.

Figure 15: Prices of inputs from maize and wheat



Source: RFIs, average across companies

Figure 16: Price ratio of maize grain to maize germ (left), and wheat bran to wheat pollard (right)



Source: Calculation based on RFIs, the average across feed companies

In terms of the supply channels and pricing to feed producers in Kenya, we understand that for soymeal and sunflower cake, which is almost entirely imported, intermediary traders and brokers may also play an important role.

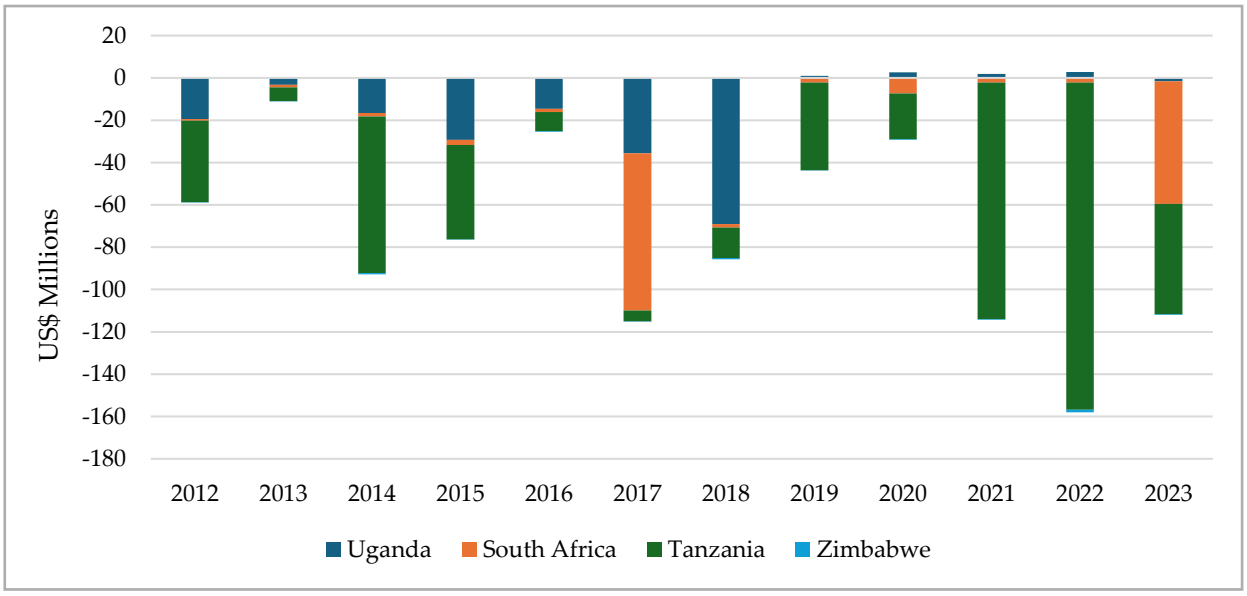
5.2. Defining Geographic Markets

In defining a relevant geographic market, the focus is on identifying good alternative sources to which buyers (in this case the producers of feed) can switch (Motta, 2004). This may include firms whose operations go beyond national borders. This is the case for some of the agricultural inputs considered in the production of feed, as described in section 2 above. We consider the supply of inputs by their nutrient category.

Maize

While there is local production of maize in Kenya, Kenya relies on imports of maize from other countries in the region led by Tanzania to meet demand (Figure 19). Demand from the feed industry also competes with demand for maize for human consumption.

Figure 17: Kenya Maize Trade Balance



Source: Trademap

Maize prices have been observed to be susceptible to a range of market developments, including La Niña drought conditions, trade restrictions imposed at various times by different countries, and apparent mark-ups across borders. This has meant substantially higher Kenyan prices relative to other regional countries, including Malawi, Tanzania and Zambia as key producing areas.

Although Kenya imports some of its maize requirements, it is not necessarily a regional market as we understand that feed processors obtain maize and its by-products, as well as wheat by-products, from the local milling industry. Nonetheless, we see the effects of La Niña on local maize prices with sharp increases from January 2022. Prices rose from Ksh. 30/kg in January 2022 to reach Ksh. 60/kg by mid-

year. From mid-2022 through 2023, prices fluctuated between Ksh. 50/kg and Ksh. 60/kg. However, prices to smaller producers went as far up as Ksh. 70/kg. It is important to understand the local maize milling market further, as a way of understanding whether price increases from 2022 were justified, or whether other factors should be considered. We map the local milling industry in section 5.3 and analyze prices and competition further in section 6.

Soybean meal/cake

The main sources for Kenya are Zambia and Malawi which have significantly increased their exports of soybeans, soymeal, and oilcake within the region, starting from a relatively low base. In 2021, combined exports from these two countries reached just under 500,000 tonnes. Considering local demand in each of these countries in the range of 200-300 thousand tonnes, this implies that exports were roughly similar to local sales (or approximately half of the production was being exported).

There has been a notable increase in intra-regional trade, both in Kenya and other regional countries. Since Kenya has no large-scale soy processors, the imports are almost entirely in the form of soymeal and cake, which are supplied by processors who crush the soybeans in Zambia and Malawi. The markets for soymeal are thus regional and cross-border in nature. We examine the recorded prices by customers in Kenya against the prices recorded for exports from Zambia and Malawi into Kenya against other exports to other countries in 2021 and 2022, given the availability of data, and against the soybean prices at the harvest in these countries.

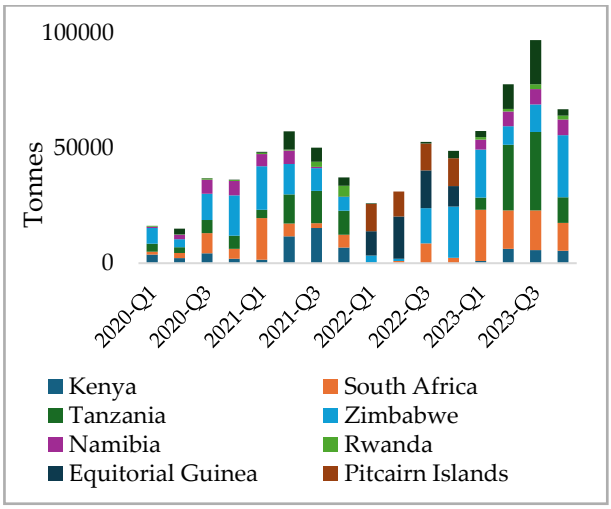
There are substantial anomalies in the trade data depending on whether it is recorded as imports into Kenya or exports recorded by Malawi and Zambia, especially in 2022. This raises questions about the role of traders across the region which we discuss further below. In 2021 Zambia recorded exports to Kenya over the four quarters of 35,000 tonnes, which is relatively consistent with the imports recorded by Kenya from Zambia, of approximately 38,000 tonnes (Figure 16). Zambia exported to a range of other countries. Malawi exported relatively small volumes to Kenya. However, in 2022 we see a sharp change in the composition of the main export destinations. Zambian recorded no exports to Kenya despite Zambia accounting for over 70% of Kenyan imports when looking at Kenyan import data (see Figure 9 above).

Conversely, there are substantial exports from Zambia recorded to the Pitcairn Islands and Equatorial Guinea, totaling just over 100,000 tonnes (Figure 17a). These are not plausible actual destinations for Zambian soymeal and must reflect book transfers by the exporting companies while the physical volumes are going to countries including Kenya. Kenyan imports totaled approximately 42,000 tonnes in 2022. Zambia also recorded substantial export volumes to Tanzania, Zimbabwe, and South Africa (where it competed with GMO soybeans) as well as to deep sea markets such as India and the UAE.

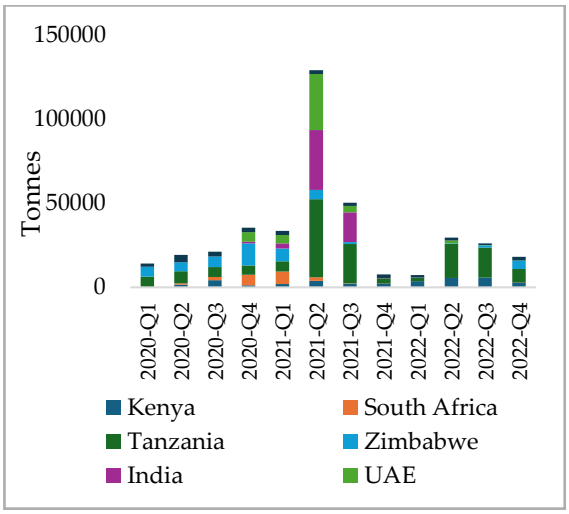
On the other hand, Malawian exports appear to match up with Kenyan-recorded imports for both 2021 and 2022. In 2021, Malawi recorded just over 10,000 tonnes of soymeal exports to Kenya, while Kenya recorded just over 9,000 tonnes. In 2022, Malawi recorded 15,000 tonnes in exports to Kenya, against just around 12,000 tonnes recorded as imported by Kenya.

Figure 18: Soybeans and soymeal exports from Zambia and Malawi, by main export destinations

20a. Zambia



20b. Malawi



Source: TradeMap

We compare price differences between Zambian exports by destination. We compare prices where export quantities are non-trivial, considered as exports that are more than 5,000 tonnes in a quarter. In this case, we only considered exports from Zambia to the destinations listed in Table 3. We see substantial price differences between exports to Kenya, and exports to Zimbabwe and South Africa in 2021, noting that these prices are on a free-on-truck basis leaving Zambia. It implies that exporters were able to differentially price depending on the degree of competition they faced in each destination market. In 2022, we have anomalous trade data with exports to Equatorial Guinea and the Pitcairn Islands. These are at substantially higher prices than those recorded in South Africa.

Table 3: Quarterly Zambia export prices, US$/kg for soymeal, free on truck, based on export quantities and values

	2021-Q1	2021-Q2	2021-Q3	2021-Q4	2022-Q1	2022-Q2	2022-Q3	2022-Q4
Zam - SA	0.45	0.38		0,47		0.31	0.40	0.17
Zam - Zim	0.44	0.50	0.56	0.61	0.63	0.63	0.56	0.50
Zam - EG					0.80	0.70	0.52	0.48
Zam - Pitcairn					0.66	0.69	0.53	0.51
Zam – Kenya*	0.51	0.51	0.61	0.79	0.82	0.75	0.50	0.49

*Note: *based on Kenyan import data for 2022 (as Zambia did not record exports to Kenya)*

The data and interviews indicate that the relevant geographic markets in which Kenya can readily source soymeal extend to Zambia, Malawi (and Uganda) and that the traders from the countries have a degree of market power over Kenyan animal feed companies as customers. The prices paid by feed producers as customers together with the prices reflected in trade flows are analyzed in more detail in section 6 below. In 2021 when there were very substantial exports to India, UAE, and South Africa, as well as to Tanzania and Zimbabwe in the region, the prices paid by feed companies in Kenya increased substantially.

Sunflower cake

The main source for sunflower cake has been Tanzania followed by Uganda. As with soybean meal, the relevant geographic markets for Kenyan feed companies are cross-border. Tanzania's exports include to other destinations, mainly China, India, Rwanda, and South Africa. However, publicly available records of these exports are only available until quarter three of 2020. For Uganda, Kenya has been the only export destination since 2021, with some patchy exports to Rwanda in preceding years.

The reliance of Kenya on imports from the region, given the absence of significant local production, means that the relevant geographic market is likely to include sources of supply in Tanzania and Uganda. In addition, we note that some of the sunflower crushers are also companies crushing soybeans.

5.3. Concentration in feed inputs

For each of the relevant feed inputs, we assess concentration taking into account the relevant market definition considerations.

Maize and by-products

There is a very large number of maize millers and it is possible to operate milling plants of different scales meaning barriers to entry are lower than in wheat milling or oilseed crushing. Concentration is very low in supplying milled maize and its by-products. The Kenyan grain milling industry has over forty formal millers, a majority of whom are members of the Cereal Millers Association (CMA).

There are concerns relating to the trading of maize. Maize prices in Kenya have increased by far more than import prices from countries in the region and indeed relative to maize prices in producing areas around Kenya (see Nsomba et al. 2022). Competition issues in trading maize within Kenya have been identified by researchers. Bergquist and Dinerstein (2020) find that there are cartel mark-ups of around 30% being made by local maize traders. These impacts are not specific to animal feed, however.

Soymeal and cake

The production of soymeal from the processing of soybeans is concentrated with only a few producers across the region (Table 4). There are around three to five crushers in each country supplying Kenya, operating at different levels of capacity utilization. Some companies have operations across the selected countries: Mount Meru has facilities in all three countries, with Wilmar, ETG, and Sunseed Oil in two. These companies are integrated into soybean crushing for vegetable oil production, storage, and logistics. Trading of byproducts such as soybean meal and cake is therefore mostly carried out by these main companies. ETG, for example, markets itself as a trader of at least 500 thousand tonnes of non-GM soybeans across sub-Saharan Africa (Nsomba et al., 2022).

Table 4: Main soybean crushing companies, crushing capacity, thousand tonnes per annum, where available

Malawi	**Uganda**	**Zambia**
ETG/Parrogate, 100	Mukwano Industries, 90 (incl sunflower)	ETG/Parrogate, 240
Mount Meru, 150	Mount Meru	Mount Meru, 128
Capital Oil Refiners, 70	Bidco/Wilmar	Wilmar/Global, 360
Sunseed Oil, 180		Sunglobe (Sunseed Oil), 55
		Alliance ginneries

Source: Kaonga et al. (2023)

Given that these are the main processors of soybeans and traders of soybean meal and oilcake across East and Southern Africa, we can reasonably expect that they can set the terms on which these products are traded.

Sunflower cake

As the sunflower cake trade is mainly limited to imports from Tanzania and Uganda, we consider the processors in these countries. Mount Meru is the only sizeable processor in Tanzania from where almost all the sunflower cake in Kenya is imported (Table 5, Kaonga et al. 2023). There are three large sunflower processors in Uganda, that are also vertically integrated into vegetable oil production, however, almost no sunflower cake is exported by Uganda to Kenya. Bidco Uganda Limited, a company that is partially owned by Wilmar, is the leading edible oil firm in Uganda. It is the biggest supplier in the market in terms of the volumes of oil they produce (Kaonga et al., 2023).

Table 5: Main sunflower crushing companies

Uganda	**Tanzania**
Mount Meru	Mount Meru
Bidco/Wilmar	
Mukwano Industries	

Source: Kaonga et al. (2023)

Wheat-milling by-products: bran and pollard

Wheat milling to produce flour is in large-scale factories which can ensure the quality and specifications for different types of baking. Wheat bran and pollard are valuable by-products of this milling (with wheat bran being priced at roughly 80% that of wheat pollard, given the different nutritional content). Both of these by-products have been cheaper than maize grain and did not increase proportionately when maize grain prices increased. This ensures a cost advantage to those able to secure the by-products at prevailing prices.

The large-scale nature of wheat milling means that these suppliers of wheat bran and pollard are concentrated. The by-products of wheat milling are inputs to animal feed manufacturing. The major primary by-products include:

- Wheat bran: the outer layer of the wheat kernel, removed during the milling process. It is rich in fibre and essential nutrients.
- Wheat germ: the reproductive part of the wheat kernel which gets extracted during milling. It has an abundance of vitamins, minerals and good fats which impart high nutrition to animal feeds.
- Wheat pollard: comprised of fine particles of bran, flour and waste from milling. It is rich in nutrition and has proteins, fibres, vitamins and minerals which serve as a healthy component for animal feeds.

[redacted] The top five wheat milling companies (each with a greater than 5% market share) collectively control over 65% of the market. In addition, most of the wheat millers are also manufacturers of animal feeds including [redacted]. This indicates vertical integration in wheat milling and animal feed manufacturing. Wheat by-products such as wheat bran, pollard, and germ, however, form a relatively small proportion of animal feed inputs mix.

5.4. Barriers to entry in feed inputs

There are major barriers to entry to supply soymeal where the minimum efficient scale for a crushing plant using solvent extraction is around 70-100 thousand tonnes per annum. Sunflower processing is similarly a large-scale industrial process requiring large capital investment. These also require sufficient production of the oilseeds to ensure the plant can be run at a reasonable capacity. In other inputs such as maize and wheat by-products, the entry requirements are lower. The premixes are sourced from international manufacturers and no concerns were raised about the ability to obtain them in Kenya.

6. Analysis of competition and market outcomes

6.1. What would be expected under competition

Competition means prices that are reflective of costs with rivalry between companies to offer better products and services to customers. Where we are considering intermediate products such as animal feed, the customers are themselves producers who require the products as their inputs. Competition in animal feed and the prices, quality, and service that result are thus essential for the competitiveness of producers of eggs, chicken meat, milk, and other animal products. In turn, it impacts the prices of these staple food products to consumers.

Fair competition also means that smaller producers can compete with larger producers, including those that are vertically integrated. There may be differential prices to the extent that large volumes have lower costs to supply, but discriminatory prices should not unfairly undermine smaller producers or exploit smaller customers.

Based on the information at our disposal, we assess the state of competition in the markets for animal feed and for the main animal feed inputs. Where market outcomes do not appear consistent with normal and effective competition, we consider the possible causal factors for the market outcomes that are observed.

6.2. Feed

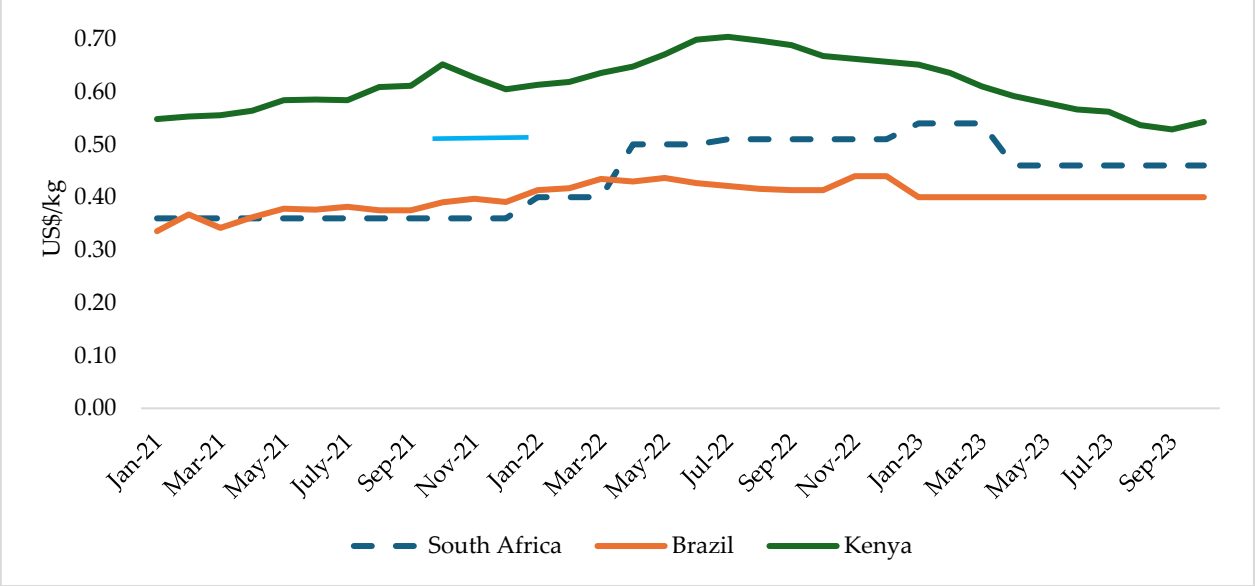
Animal feed prices have increased substantially from 2020 to 2023. The biggest increases have been in poultry feed, of around 40-50% in nominal terms from 2020 to mid-2022 (Figure 3). In dairy feeds the increases are in the range of 30-40%. The main increases mainly occurred over the 18 months from the beginning of 2021 to mid-2022. We assess the extent to which these price increases reflect increased input costs in sections 6.3 and 6.4 below. In this section, we compare Kenya feed prices to those in South Africa and Brazil and analyze the evidence on prices and competition to different customer segments and geographies

6.2.1. Cross-country comparisons

Kenyan feed prices appear to be high by international comparison (Figure 21). Using average broiler feed prices (crumbs and pellets) Kenyan poultry producers have had an average 54% cost disadvantage compared to Brazil from 2021 to 2023, and a 42% disadvantage relative to South Africa. We also note that Malaysia prosecuted a feed cartel in 2023 and the price under the cartel for broiler

crumbs in December 2021 was US$0.54/kg (blue line),[43] *less than* prices in Kenya and noting that Malaysia imports almost all the maize and soymeal for its animal feed.

Figure 19: Cross-country comparison of broiler poultry feed prices



Sources: Comparison based on data from the South African Poultry Association and for Brazil from Embrapa

Further indicating that feed prices in Kenya are relatively high, a recent entrant has been competing to supply feed to Central and Western Kenya from its production facility in Tanzania close to Dar es Salaam, from inputs imported from Uganda.[44] It has been able to offer prices in line with those in the market, even after taking into account transport costs on inputs and for the feed products into Kenya, across borders.

The higher feed prices are consistent with high poultry prices in Kenya for consumers. One company observed prices in Kenya are roughly double that in South Africa, at around US$4/kg compared to US$2/kg of processed chicken.

6.2.2. Competition for different customer segments and geographies

The largest feed companies supply across Kenya and use a network of distributors to reach customers in the main markets. The prices are set on an ex-factory basis and in different geographic areas to

[43] Malaysia Competition Commission, Case No. 700-1/2/1/2021 non-confidential infringement decision, p.88, using an exchange rate of 4.18, from 112 Ringgit per 50-kg bag.
[44] Interview Firm L.

allow the distributors to earn a margin. Other companies supply only some regions of Kenya and generally also engage distributors.

Geographic markets and pricing

Competition means that prices to customers would be expected to reflect transport costs, as a significant cost to supply. This also reflects the potential, in the absence of restrictive conditions, for distributors and large customers to be able to buy from the factory gate using their transport, with these transport costs then being included in the price charged to customers.

Feed companies were asked for their pricing by main geographic region.[45] Most companies have a delivered-to-the-dealer price, which is the same across the country.[46] If the dealer collects from the factory then a transport discount or subsidy is provided.

- The 'product and transport discount' for [redacted] in June 2023 ranged from Ksh. 25/bag in Western/Nyanza to Ksh. 100/bag for the Coast. Nairobi & environs was Ksh. 30/bag.[47] This means that different prices are charged net of the transport discount, for products destined for different regions. To ensure that dealers do not misreport products for the Coast (to qualify for a higher discount) while it is actually for a lower discount region such as close to Nairobi, they require dealers to verify the customers they are selling to and their location.
- [redacted] indicated prices are delivered, but distributors can collect.
- [redacted] indicated that discounts are not strictly related to distance as, for example, there are lower transport costs to the coast than, e.g. to Meru as there are return loads available to the coast.
- [redacted] prices on a delivered basis across Central/Mt Kenya, Highlands, and Eastern (with 95% of sales being delivered), however, if collected then there is a Ksh. 55/bag discount.
- [redacted] sells the majority of feed delivered to distributors who supply to stockists; prices are the same across regions apart from Kiambu where due to more intense competition from informal feed suppliers in Thika, they have prices which are lower by Ksh. 100-150/bag. Transport rebates are provided if distributors collect. These range from Ksh. 50/bag to Kiambu, to Ksh. 200/bag to Meru.

[45] Incomplete responses were received; the assessment here reflects the preponderance of responses. Interviews provided further insights into how prices are set across Kenya.
[46] See for example, companies B, C, E, H, I.
[47] The discounts are generally, but not always, the same across products. The discounts in 2023 were very similar to discounts pertaining over the previous three years.

- [redacted] prices on a delivered basis with 80% of their sales in Western Kenya, from the factory in Nakuru.
- [redacted] indicated that they only set the ex-factory price and that prices in the regions depend on the distributors.

The coastal region is a substantial market for poultry feeds and has relatively lower effective prices for sales to this market, however, only [redacted] can compete effectively in this region as they have a production factory in the region.[48]

There may also be ***volume-related*** discounts and rebates, which range from around 1% to 4%, as follows:[49]

[redacted]

Some dealers work exclusively for one feed supplier (such as [redacted]) although it appears most distributors operate on a non-exclusive basis while being influenced by the rebates on offer. Feed companies did indicate that distributors have identified territories within which they supply. Some smaller companies also indicated that there was an understanding about territories they would be restricted.

Dairy feed

The two largest feed producers each supply dairy feed as do most of the medium-sized producers. Some such as [redacted] are oriented toward dairy. The prices of most companies have fluctuated with input costs, although products positioned as more premium have been less responsive (Figure A1). The largest inputs by value in both standard and high-yield dairy meals are all milling by-products in the form of wheat pollard, wheat bran, and maize germ (Figure 7). This implies close links between the sourcing of inputs and milling of wheat and maize.

There are concerns about setting delivery prices across the country as this does not reflect different transport costs to supply to regions. These costs could be as much as 5-10% of standard dairy meal for the regions with the highest transport costs (see, for example, implied costs of [redacted] to supply to Meru).

Poultry feed

[48] Interview with Firm D.

[49] We use 2% when we adjust ex-factory prices to take account of volume discounts and distributor commissions in Table 6.

Poultry is by far the largest animal feed market. Within poultry, there is an important distinction between layer feed which is generally in mash form, and broiler feed (increasingly in pellet form) which requires higher specifications. As with dairy feed, we note concerns regarding prices being set for poultry feed on a uniform basis delivered across the country, and not reflecting transport costs.

Broiler pellets (starter crumbs and finisher pellets) are more concentrated as only a subset of feed producers supply these products. The number of suppliers has increased as companies have made investments to be able to manufacture pellets. They are also higher-priced products as they use a larger proportion of soymeal and full-fat soy (Figure 7).

The newer entrants in broiler pellets have had some competitive impact as indicated in price reductions being charged over 2023 as input prices came down (Figure A3). However, incumbents raised their prices once again in the third quarter of 2023 suggesting the competitive impact is limited. We consider the responsiveness of prices to costs in the following sub-section.

There is vertical integration between the largest feed producer [redacted] and the largest poultry producer [redacted] given their common shareholders. Other feed producers are also integrated with poultry breeders and producers, with [redacted] almost entirely producing poultry feed (90%+ of their feed businesses). The vertical integration of these feed suppliers could raise concerns about differential or discriminatory pricing between their businesses and partners, and third-party customers. However, there are non-integrated companies [redacted] that also produce substantial quantities of broiler feed for sale to third parties.

6.3. Inputs

The most important single issue relating to animal feed pricing and supply in Kenya has to do with the availability and pricing of key inputs. We assess the state of competition in the supply and pricing of the main inputs before assessing feed prices against input costs in the following section.

The assessment of competition in the supply of inputs includes the access at fair prices for smaller feed companies in Kenya which has a significant bearing on their ability to compete and grow. We focus on markets for the supply of maize and milling by-products, soybean meal, and sunflower cake as the main inputs across various feed types (see Figure 6). As these inputs are internationally traded, and Kenya has relied on imports to meet domestic demand, we consider the pricing and supply for traded volumes to Kenya in light of supplies to other countries. This includes assessing whether there are indications of market power and anti-competitive arrangements in input markets at the regional level as defined by the relevant geographic markets.

Maize prices and supply

As the single largest source of carbohydrates and energy in various formulations of animal feeds, maize represents approximately 60-70% of some specified animal feeds by volume (see Figure 6). In

dairy feeds, by-products of maize and wheat milling are the main sources of energy, with wheat products being an important source of carbohydrates and fibre. There is some level of substitutability between maize, wheat, and their by-products, especially in dairy feeds and poultry layer mash. The increased maize prices over the period have made access to competitively priced milling by-products even more important for feed suppliers. This is especially the case from the second quarter of 2022 when the relative price of maize grain to by-products increased significantly (Figures 17 and 18). For poultry broiler feeds, maize grain has remained the first choice for sources of carbohydrates and energy amongst poultry feed producers.[50]

Some feed producers are integrated into the milling industry (for both maize and wheat), such as [redacted], which means they may obtain favourable pricing, as we assess below.

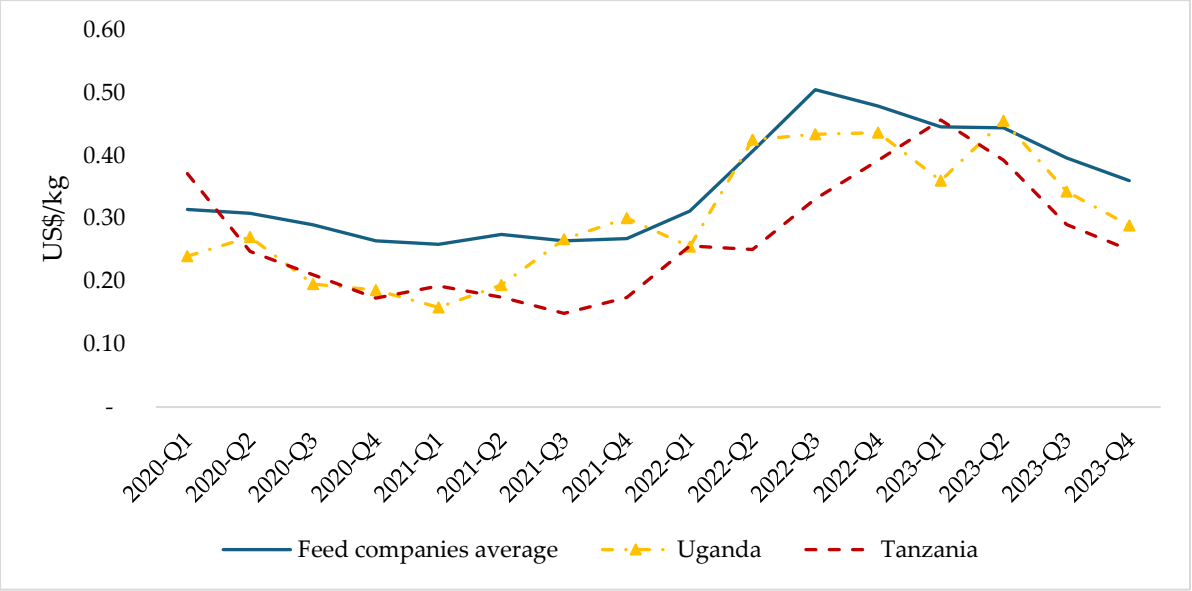
Maize in Kenya is primarily used as a staple for human consumption, meaning the animal feed industry can be seen as competing with human demand when maize supplies are constrained. In other countries, both white maize and yellow maize are grown with yellow maize being used mainly for animal feed, however, little yellow maize is grown in East Africa (Nsomba et al., 2022). In the period assessed here, maize production has also been impacted by droughts and extreme weather. These conditions are likely to become more frequent and more severe.

We consider the differential pricing of maize grain across feed producers relative to the rest of the region. We focus on maize grain as the main traded product, given that maize germ is a by-product with less price variation over time. The maize grain prices paid by feed producers are observed to be in line with each other with no significant differential pricing by volume or size of the producer over the period (Appendix Figure A8).

We compare the average maize prices of Kenyan animal feed producers to market prices in producing countries such as Uganda and Tanzania (Figure 22), where the bulk of Kenyan maize imports originate, as well as to evidence on prices in different parts of Kenya where maize is grown in substantial quantities.

[50] Interview with Firm C.

Figure 20: Maize grain prices, Tanzania, Uganda, Kenyan feed producers



Source: data from information requests, Ministry of Agriculture Tanzania, African Market Observatory Uganda

Over much of 2020 and 2021, Kenyan prices were around US$ 50-100/Mt (US$0.05-0.10/kg) above the prices in the best alternative sources of imports, from Tanzania and Uganda (Figure 22). From 2022, maize prices increased sharply in Kenya and across the region largely due to the effects of extreme weather conditions. By the end of 2023, while prices had reduced, they had not yet returned to the levels in 2020 and 2021.

The weather impacts raise questions about cross-border markets and regional trade. While drought conditions may affect one part of the region, there are good rains in other parts (Nsomba et al., 2022). In addition, there is abundant water and agricultural land in East Africa, however, ensuring sustainable agricultural production means investing in irrigation and water management to reduce reliance on rainfed production. The incentive to invest in improved production requires farmers to receive fair prices. There are also issues with fertilizer supply and pricing which have been considered in recent research (Roberts et al., 2023).

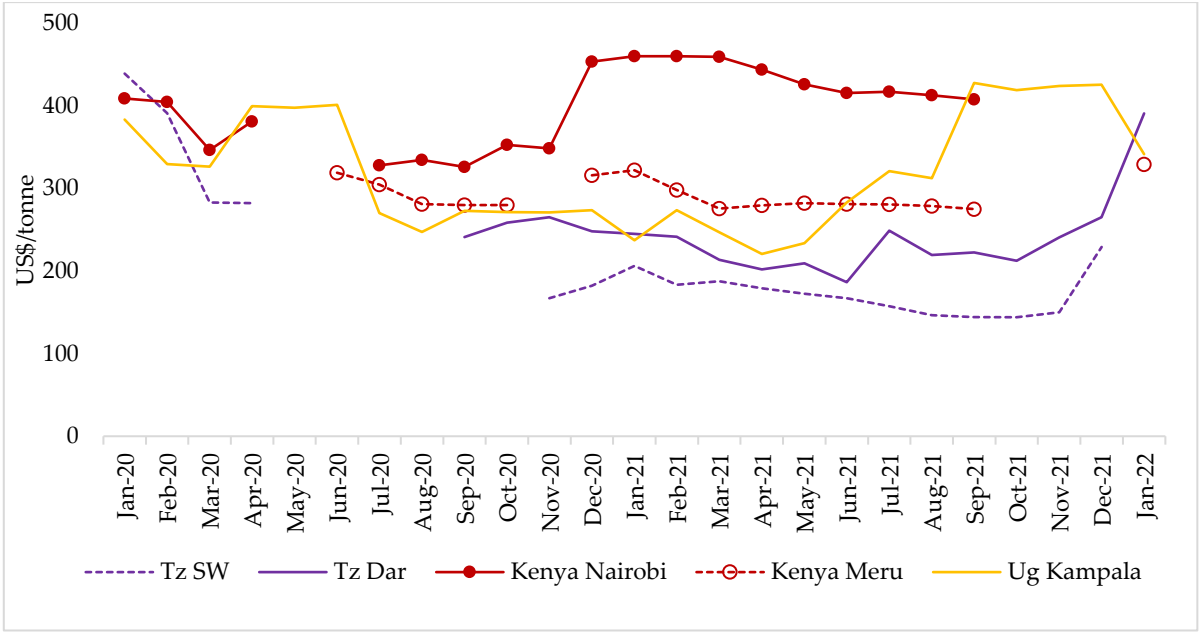
If transport costs and trading margins are high this means that farmer prices are suppressed (undermining the incentive to invest in improved production) and prices to buyers including the animal feed sector in Kenya are inflated. We consider the difference between prices in Kenya to feed producers and in the exporting countries. The gap has often been more than US$100/Mt or US$0.10/kg between countries sharing a border in a common market and with transport distances of well under 1000km. Transport costs depend on the distance travelled as well as other factors such as border effects, regulatory costs and duties, and whether there are return loads for truckers. Estimates of

transport costs, including the Authority's Competition in Shipping Trucking and Haulage Sector Market Inquiry Report 2019, are that efficient costs should not be more than US$0.04 per metric tonne per kilometre including costs of border crossings (see also Nsomba et al., 2021 and 2022). This means that costs should not be more than US$40/Mt or US$0.40/kg for distances up to 1000 km which is more than sourcing from Uganda to Nairobi (with good return loads available reducing costs further), and from growing regions in south-west Tanzania.

We estimate reasonable and efficient transport costs, acknowledging that many factors need to be taken into account, including border costs and delays, length of trip (as the loading and unloading involve costs that are spread out over longer trips), volumes, and the potential for backhauls. Efficient transport rates of US$0.04 per tonne per kilometre for competitive markets for road transport were confirmed in interviews and recent studies of bulk commodity trading in East Africa (Kaonga et al., 2023; Roberts et al., 2023).

While there are variations over time, there are trading margins that are for much of the time more than double efficient rates. This is consistent with research that has found excessive mark-ups by Kenyan maize traders in line with collusion (Bergquist and Dinerstein, 2020). In the initial phase of EAGC's donor-supported Regional Agricultural Trade Intelligence Network (RATIN), the data was publicly available. At this time, it demonstrated that even within Kenya there were very large disparities between the prices where maize is produced and where it is consumed (Figure 23). The prices in Nairobi in 2021 were over 50% higher than in Meru for much of 2021, although feed producers were not paying prices which had been marked up as much as this in 2021 (Figure 22 above and Figure A8).

Figure 21: Bulk maize prices



Source: replicated from Figure 13, Nsomba, Roberts, Tshabalala, Majengwa (2022), using RATIN prices for Kenya.

We note that there have been major concerns with the quality of maize being traded, especially with regard to the prevalence of aflatoxin, and with *ad hoc* trade barriers. One animal feed producer noted that a large proportion of maize purchased could be affected by high aflatoxin levels and thus could not be used in its animal feed.[51] These concerns are outside the scope of this Inquiry. We note that failure to address the concerns of aflatoxin lowers prices for farmers across the region and harms the animal feed industry in Kenya in a lose-lose situation.

Milling by-product prices and supply

Milling by-products are important in several feed products. Maize germ accounts for as much as 30% of the volume of dairy feed and to an extent is an alternative for maize grain in poultry feeds as a good energy source. Wheat pollard accounts for a substantial share of the volume of dairy feeds for some producers. Maize and wheat bran appear to be of less importance.

Companies that are vertically integrated with the milling of wheat and maize may be at an advantage in terms of guaranteed supply of by-products and possibly also in their pricing. We find that there are differences between feed companies in what they have paid for the inputs and these differences are substantial at different times. For example, [redacted] sourced maize germ at prices around 25%

[51] Interview with Firm E.

lower than the other companies for much of 2020 (Figure A4). [redacted]'s prices while somewhat higher were relatively stable while [redacted] paid prices which fluctuated monthly and they also looked to source from Uganda at similar prices delivered, as sourced locally. [redacted] has also recorded lower prices for maize bran for much of the period (Figure A5). Wheat pollard prices have been more closely aligned (Figure A6). There are also variations in the prices being paid for wheat bran (Figure A7).

Soybean meal prices

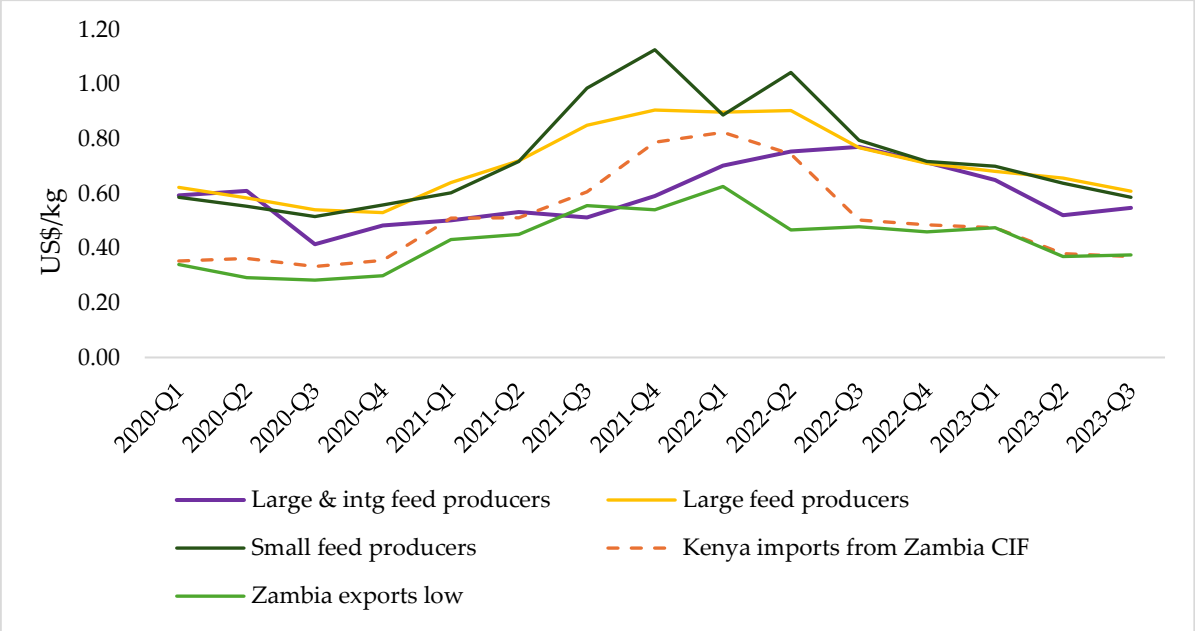
Soybean meal represents an important protein source for animal feeds, particularly in layer and broiler feeds. Across layer and broiler feeds, soybean meal represents on average approximately 20-30% of the feed composition, with the higher proportions in broiler pellets (see Figures 6 and 7). While sunflower cake is another protein source, it does not lend itself as a direct substitute for soybean meal. The dairy feeds require less protein generally. The state of competition in soybean meal markets, including prices and terms of access for the input, therefore has more of an impact on producers of poultry feeds than dairy feeds.

Soybeans are grown in large volumes in Zambia, Malawi, and Uganda, with Zambia and Malawi being the main exporters to Kenya. As soybeans need to be processed for the soymeal and soy cake which is required for most animal feed the main processing (crushing) businesses in Zambia and Malawi are the suppliers of soymeal which is traded into Kenya and other countries. Soybean processing is relatively concentrated, as set out above.

Soymeal prices paid by Kenyan feed producers increased very substantially from the end of 2020, almost doubling in US$ terms (Figure 24). These increases do not appear fully justified by increases in the prices in the source countries for soybeans and for exported soymeal. Moreover, there have been quite different prices recorded by different groups of animal feed producers for imported soymeal. Prices paid by some feed producers have been substantially higher than fair cost-reflective prices, including trading costs, throughout the period 2020 to 2023.

For the year 2020 (see Figure 24), we see Zambian export prices into Kenya being below US$0.40/kg (or US$400/Mt), while prices levied on feed companies were at levels which ranged from $0.60/kg in the first quarter to around US$0.53/kg in the fourth quarter. For much of the year, this reflected a margin between the free-on-truck price from Zambia and the price into Kenya of close to US$0.20/kg which was substantially greater than transport costs (of around US$0.08-0.10/kg).

Figure 22: Soymeal prices, exports from Zambia, Kenya imports from Zambia, paid by Kenya feed producers



Source: data received from information requests, TradeMap

Notes: 'Kenya imports' are as recorded by Kenya. 'Zambia exports low' are Zambia FOB recorded exports to Kenya for 2020 – 2021 and 2023, 2022 data is the average of Zambia exports to South Africa and Zimbabwe (as Zambia had no recorded exports to Kenya in this year).

This is consistent with some large regionally integrated feed producers sourcing soymeal at around 20% lower prices than the average from the third quarter of 2020. In 2021, even while international prices increased somewhat, Zambia continued to export to other countries at much lower prices than prices to Kenyan buyers (Figure 24). The export prices from Zambia in 2021 (and those paid by integrated Kenyan feed producers) were around U$0.50. This is in line with the soybean prices recorded in Zambia at harvest of around U$0.40/kg and the prices recorded for exports from Zambia to South Africa, with an allowance for transport to Kenya. These are producers that have backward linkages into the inputs for feed, including through regional links and relationships with processors and traders of inputs such as soymeal. These producers are also typically integrated forward, into the production of poultry.

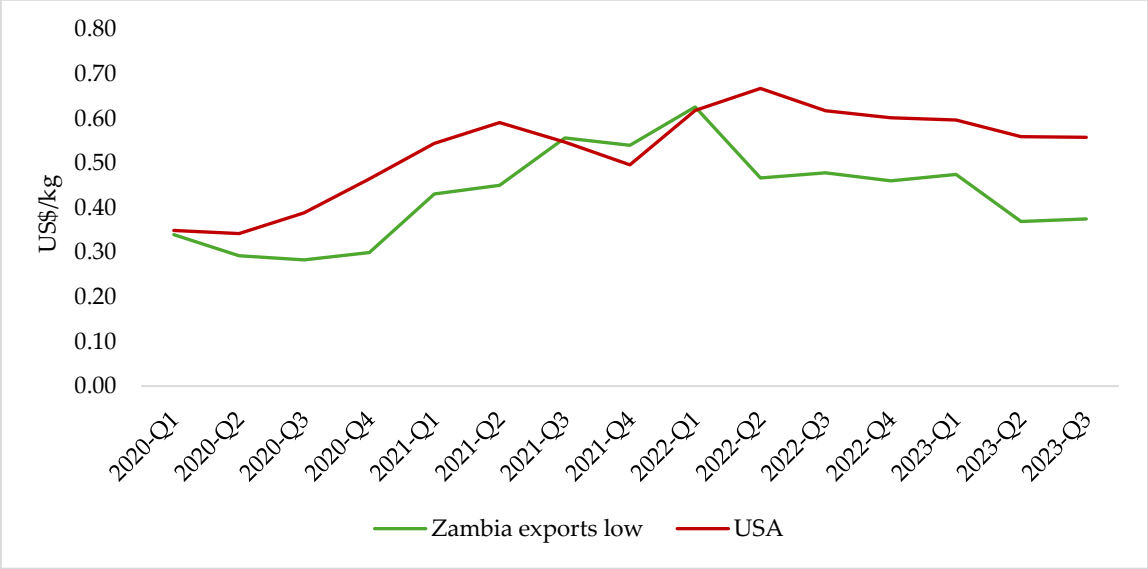
Other companies in Kenya paid prices that were 60-90% higher. Medium and small-sized feed producers receive the highest prices throughout the period. In this case, producers are considered those that supply feed in specific regions in Kenya, and not nationally. Larger and integrated producers have a more national reach and are in some cases vertically integrated into poultry production as well as having regional links to suppliers of soybean meal. The higher soymeal prices

substantially undermined the competitiveness of the non-integrated animal feed companies, squeezing their margins, especially for poultry broiler feed which relies more heavily on soymeal.

Towards the end of 2022, prices amongst feed producers converged and remained roughly in line through 2023. The prices were, however, substantially higher than export prices.

The substantial net exports from East and Southern Africa into deep sea markets mean that Kenya's animal feed producers should be getting soymeal *below* world prices. There were very substantial exports by Zambia and Malawi to India, UAE, and South Africa, as well as to Tanzania and Zimbabwe in the region. This is consistent with the Zambian export prices (Figure 25). However, the prices paid by feed companies in Kenya increased substantially more than the international prices in 2021. In other words, there was substantial discrimination against Kenyan buyers of soymeal. There were also continued significant differences in the prices paid by large and integrated feed producers compared with non-integrated producers, especially smaller producers.

Figure 23: Soymeal prices: international prices and Zambia export prices



Source: data received from information requests, TradeMap, SAFEX

Factors explaining the high and differential prices paid by Kenyan animal feed producers

In answering this, we consider prices from Zambia to various regional destinations in more detail, against Kenya. Again, we see substantial price differences between exports to Kenya, and exports to Zimbabwe and South Africa in 2021, noting that these prices are on a free-on-truck basis leaving Zambia. It implies that exporters were able to differentially price depending on the degree of competition they faced in each destination market.

The ability to direct volumes to lower-priced markets and to sustain high prices in Kenya implies that there is control over supply volumes in order to have the power to set prices. This is the definition of market power. In this case, there are several suppliers responsible for the traded volumes and so it implies coordination to be able to influence prices to the extent that has been observed. Companies would ordinarily not want to export to the low-priced locations and would have an incentive to instead sell into the higher priced markets such as Kenya, which would compete down the prices in Kenya. To prevent this from happening arrangements would be required to ensure that companies each excluded the surplus volumes from the regional markets through exports and shared the high-priced markets, led by Kenya.

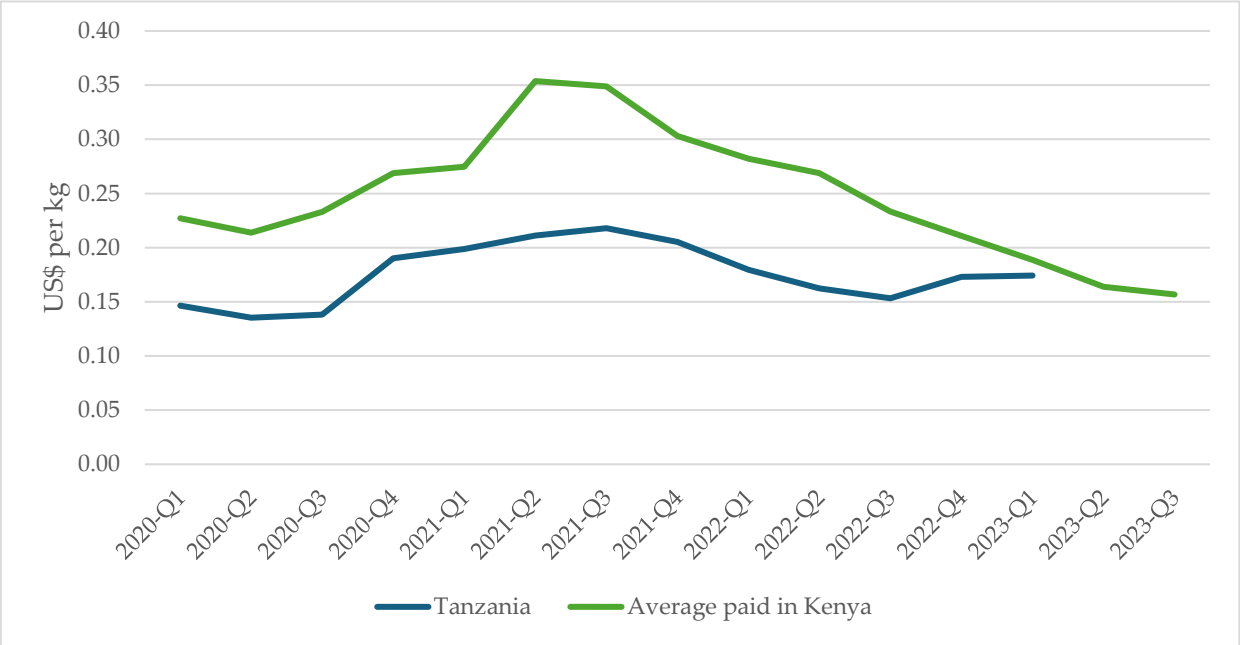
Control over the volumes to sustain higher prices in Kenya can be assisted by information exchange, and monitoring of exports such as through export permits (see Kaonga et al., 2023, p.22 and 28). We analyze this in more detail in section 6.5.

In addition, in 2022 we observed anomalous recording of trade flows with exports to Equatorial Guinea and the Pitcairn Islands. These are not locations to which soymeal can be readily supplied and, at the same time, there are very low volumes recorded as being exported to Kenya. However, Kenya reports imports from Zambia. It appears likely that the volumes being recorded in Zambia as exports to the Pitcairn Islands and Equatorial Guinea included volumes that were destined partly for Kenya but were invoiced to a trading entity registered in the Pitcairn Islands and Equatorial Guinea (such as for tax purposes). It would be important to consider whether and with what justification transfer pricing has been applied to these trade flows.

Sunflower cake

We map the prices of sunflower cake, free-on-truck from Tanzania inferred from trade data, against prices received from selected feed producers through information requests (Figure 26). In 2020, Tanzanian prices were around US$0.15/kg with prices paid by Kenyan animal feed producers between US$0.21 and US$0.23. In 2021 to 2022 the gap between Kenya and Tanzania prices opened up further to between US$0.10-0.14 per kg. With reasonable transport costs no higher than US$0.04/kg from Tanzania these prices are around 25% higher in 2021 to mid-2022 than justified by the costs of import.

Figure 24: Sunflower cake prices, Tanzania exports and paid in Kenya by animal feed companies



Source: data from information requests, TradeMap

6.4. Price-cost analysis

The effects of input costs on prices can be assessed by examining the costs relative to feed prices for the main feed categories, namely layer mash, broiler pellets, and standard dairy mash.

To do this we take standard formulations for 2020 (from company interviews) before the major changes in prices occurred. We examine the effects on a company's costs of feed production, including the effects of differential prices on costs and the ability to compete.

We then consider the impacts on smaller and non-integrated feed companies, including taking account of their ability to substitute alternative inputs.

6.4.1 Impact of feed inputs on feed prices and competitiveness

The calculations demonstrate that the substantial increases in feed prices have mainly been driven by input costs. The large feed companies passed on the cost increases to feed prices and maintained a relatively stable profit margin. This means that the increased input costs were passed onto poultry and dairy farmers, undermining their competitiveness and contributing to higher food prices in Kenya.

The smaller companies were unable to pass on the higher costs to consumers, and hence faced a margin squeeze in products that required large proportions of soy-based inputs. For the calculation

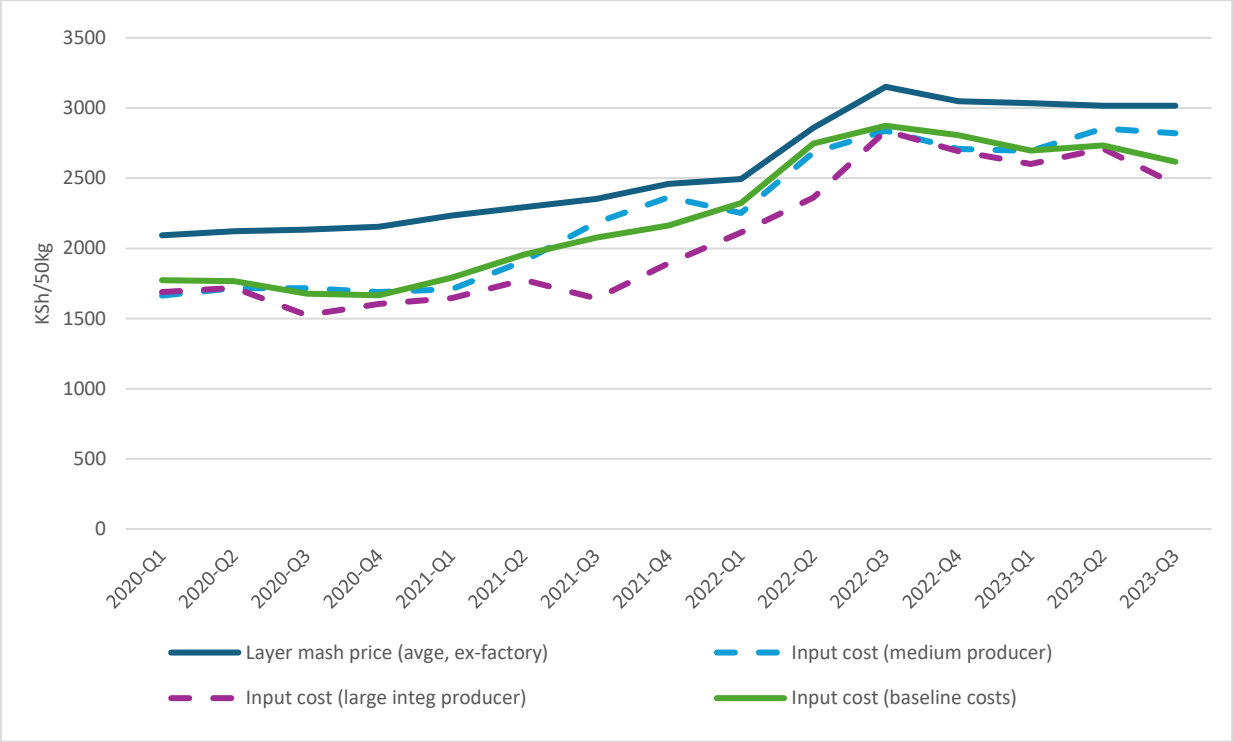
of the impact on feed costs, we use a standard feed formulation from the period January to September 2020, before the input prices changed significantly. Companies did attempt to substitute to a limited degree, as we assess below, and hence we are considering the cost impact if they had maintained the same fixed proportions.

Layer mash

In the formulation of layer mash, around half by volume is maize grain, with around 17% and 10% from soymeal and sunflower cake, respectively. The remainder is by-products and premixes. In terms of value, protein sources from soy and sunflower accounted for between 35-40% of costs (with premixes being around 10% by value) in 2020.

From the beginning of 2021 to the third quarter of 2022 the effect of higher input prices was to increase costs for layer mash on the standard formulation by around 70% from around Ksh. 1700/50kg to close to Ksh. 2900/50kg (Figure 27). However, not all feed producers faced the same price increases for soymeal, while some smaller producers had higher cost increases. Costs for small producers were higher than for large integrated producers by an average of 13% for the two years from Q3 of 2020 to Q2 of 2022. This is a significant difference given profit margins for feed companies of around 15%, including distributor margins, and before additional rebates and discounts. It also does not take into account all the other manufacturing costs. Net margins are around 7-8%, which implies that the higher costs of smaller producers mean that they will struggle to compete with the integrated producers to obtain favourable input costs and supply.

Figure 25: Costs and prices for Layer Mash

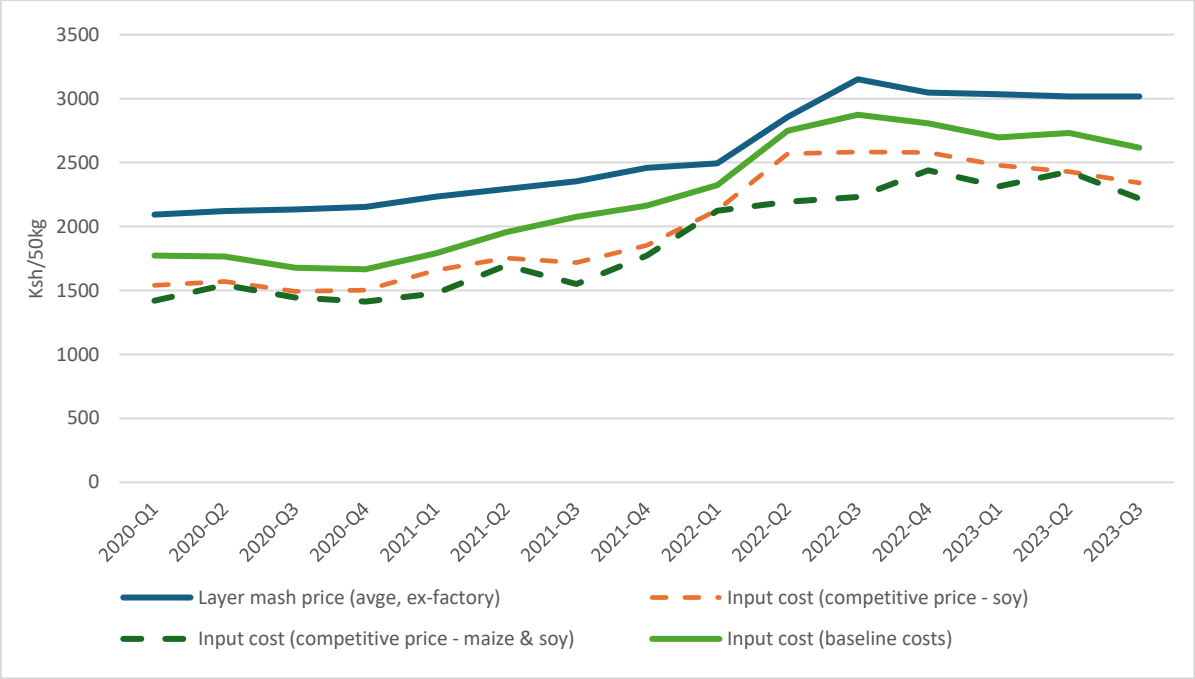


Source: Authors' computation from RFIs

The analysis of input markets indicates that efficient competitive markets would have meant much lower prices for Kenyan feed companies. We use the competitive soymeal prices, as imported to Kenya from Zambia or paid by the integrated producer to get a feed cost with competitive soymeal prices (Figure 28). We then further include an estimate of competitive maize import prices plus reasonable transport costs (conservatively estimated at US$60/Mt, or US$0.06/kg, from southwest Tanzania or US$40/Mt from Uganda). This gives a competitive total layer feed cost estimate which is 16% lower than the baseline costs on average and would have peaked at Ksh. 2439/50kg instead of Ksh. 2874/50kg. Passing this on proportionately to lower layer feed prices would have meant savings to egg producers of Ksh. 1.3 billion per annum over this period.[52] This saving on feed costs would have meant more competitive egg production, more jobs and economic activity, and lower egg prices to consumers with similar savings to consumers if lower costs passed on to egg prices.

[52] This is based on total commercial feed sales of 500th metric tonnes per annum, of which 31% is layer feed and an average price over the period of Ksh. 2564/50kg, with a 16% lower price (assuming the percentage margins of feed producers are maintained with lower costs).

Figure 26: Costs and prices for Layer Mash: imputed competitive soy and maize



Broiler crumbs and pellets

Broiler chicken growers can use mash or can use pelletized feed which is better for performance. The pelletized regime (of around 42 days) that we analyze starts with smaller 'crumbs'[53] in the first half and then moves to pellets for the second half for the 'finisher' regime. Protein, mainly from soybean sources, is very important in both the starter and the finisher phases, accounting for volume for around 40% of the starter phase (crumbs) and over 30% by volume for the finisher phase (and a much higher proportion by value). Some fishmeal is used also for protein in the starter crumbs.

The increase in input prices drove up prices of feed, with pellet prices increasing by one-third in 18 months from the first quarter of 2021 (Figures 29 and 31). Margins were severely squeezed for small/medium non-integrated producers, and were negative in Q4 of 2021 for pellets, even when we just consider the input costs of the feed constituents. If we take into account other manufacturing and distribution costs, along with netting out standard discounts and transport allowances from the ex-factory price, then it is likely that smaller feed producers faced negative margins on broiler crumbs

[53] Sometimes called 'crumbles'. As the chickens eat less per day when they are smaller, the proportion of feed consumed over the whole period is weighted to finisher pellets.

and pellets from Q3 of 2021 through the remainder of the period to Q3 of 2023 (see below section 6.4.2).

Figure **27***: Costs and prices for Broiler Starter Crumbs*

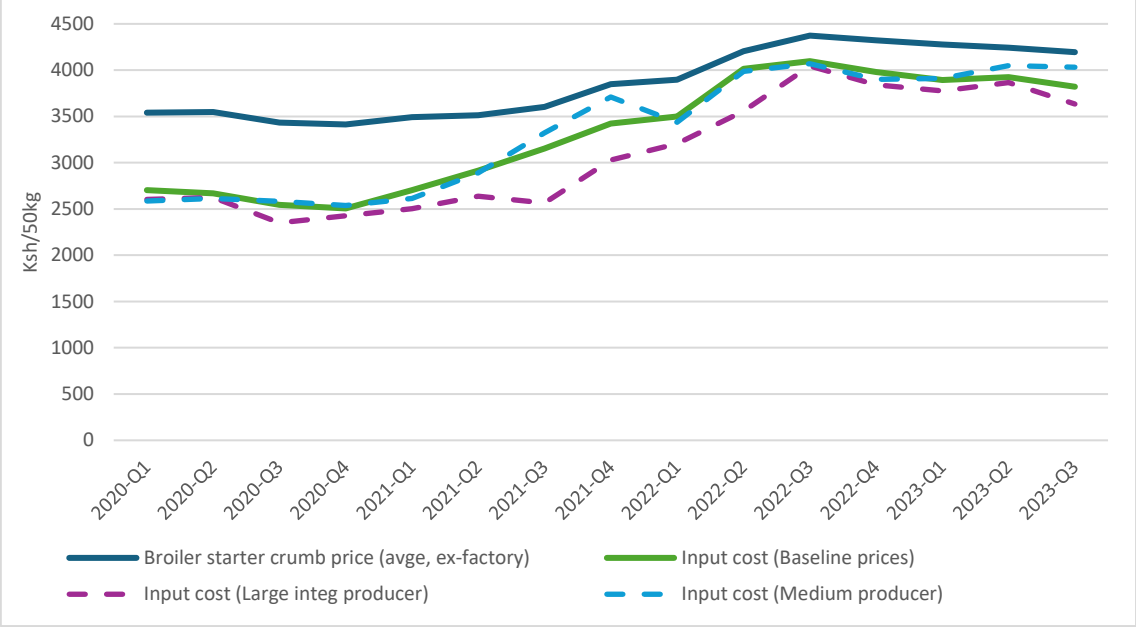


Figure **28***: Costs and prices for Broiler Starter Crumbs: imputed competitive soy and maize*

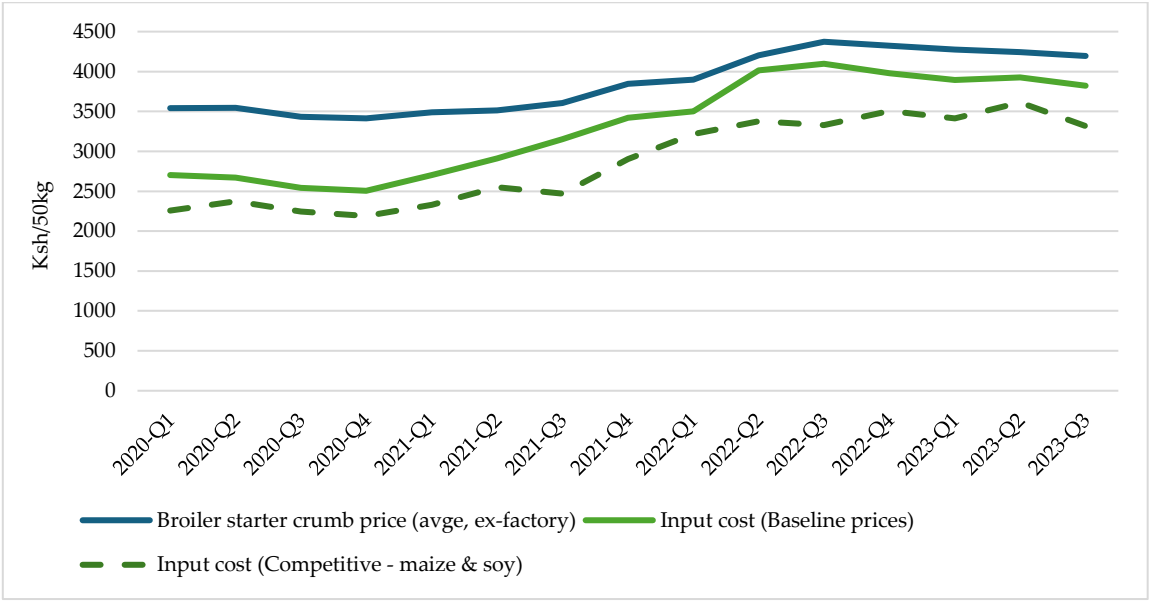


Figure **29***: Costs and prices for Broiler Finisher Pellets*

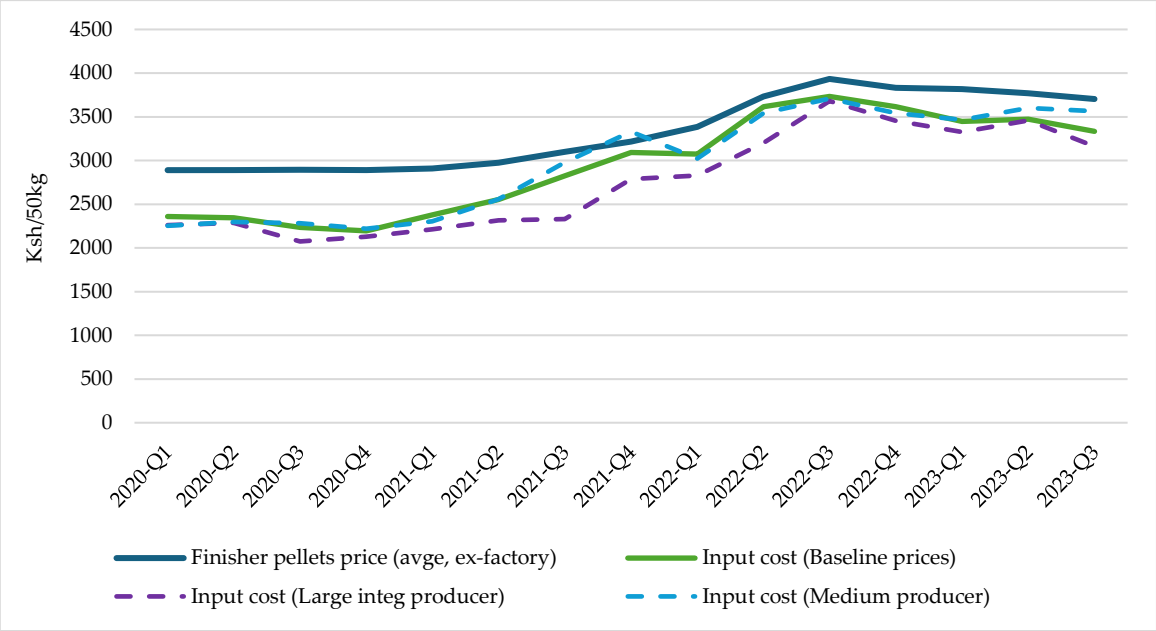
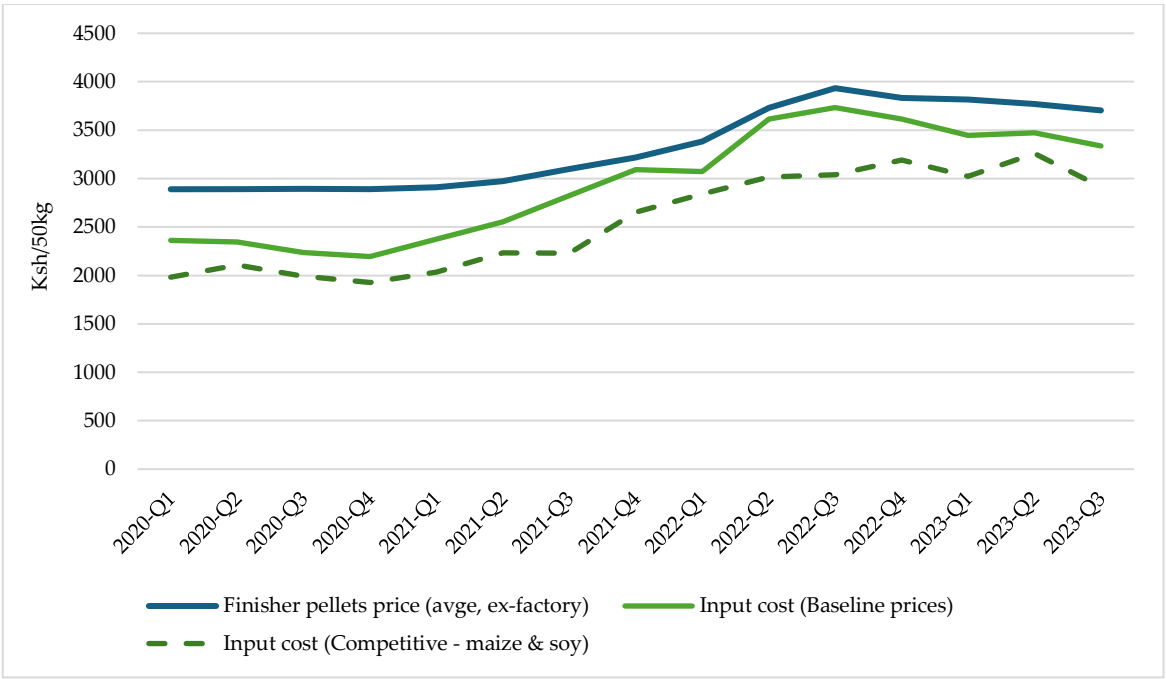


Figure 30: Costs and prices for Broiler Pellets: imputed competitive soy and maize



When we take into account cost-competitive prices for inputs then broiler crumbs and pellet input costs would have meant total input costs that are significantly below the baseline costs, by an average of 16% for crumbs and 13% for pellets over the period under review. If this were to have been passed through proportionally into lower poultry feed prices, then there would have been savings of Ksh. 1 billion per annum on pellets and crumbs, and a similar amount on broiler mash, meaning overall savings on broiler feed in the order of Ksh. 2 billion per annum.[54] When added together with poultry layer feed, the total savings would have been more than Ksh. 3 billion to poultry and egg producers.

Dairy meal

The main constituents in standard dairy meal are the milling by-products of maize germ, wheat pollard, and wheat bran for energy. Protein is less than 20% by volume (Figure 6). Dairy meal prices have nevertheless been driven up by around 30% from the end of 2020 by increased input costs (Figure 33), as the by-product prices have increased along with the grain prices. Input costs have not differed substantially between smaller and larger dairy meal producers, other than in the second half of 2021 when costs were around Ksh. 200/50kg or around 13% higher for smaller producers.

The costs of the key inputs were a little higher than estimated competitive prices, especially in 2021 (Figure 34). However, we have only made estimates for competitive input prices for maize grain and soymeal (including full fat) while dairy feed makes use mainly of milling by-products. Dairy meals have thus been much less affected by maize grain and soy prices above competitive levels. The prices of milling by-products have likely been influenced by the sharply higher prices of grain in Kenya.

[54] As indicated above, calculation based on estimated total commercial feed sales of 500th Mt per annum, of which 19% is broiler crumbs and pellets, which in turn had an average price over the period of Ksh. 3608/bag for pellets and crumbs. Broiler mash (starter, grower and finisher) has experienced similar input increases.

Figure 31: Costs and prices for standard Dairy Meal

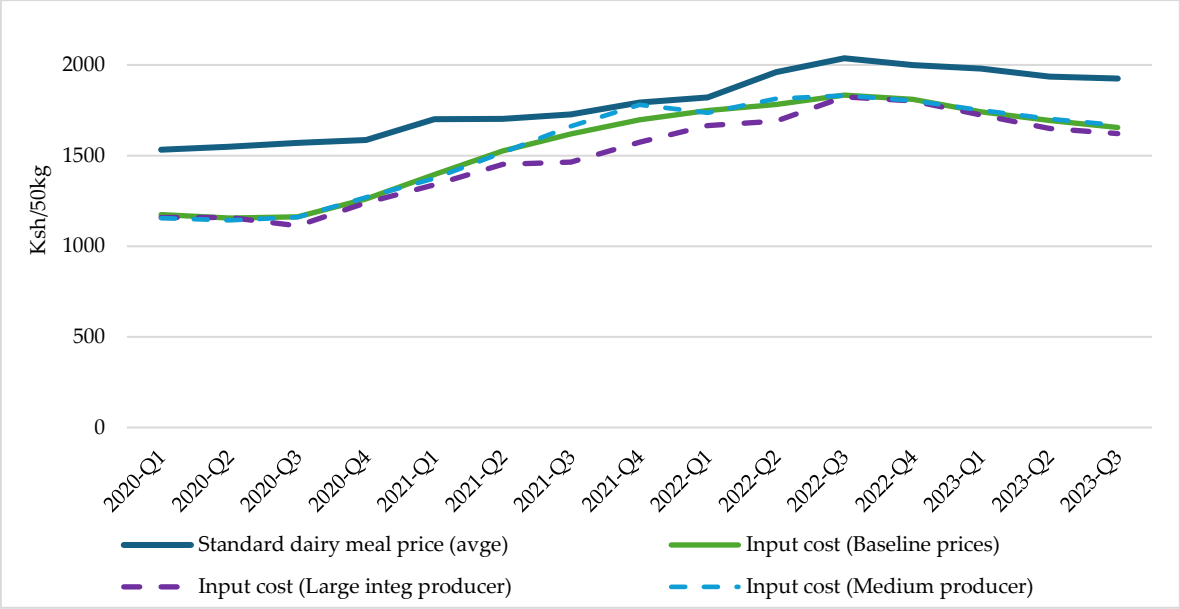
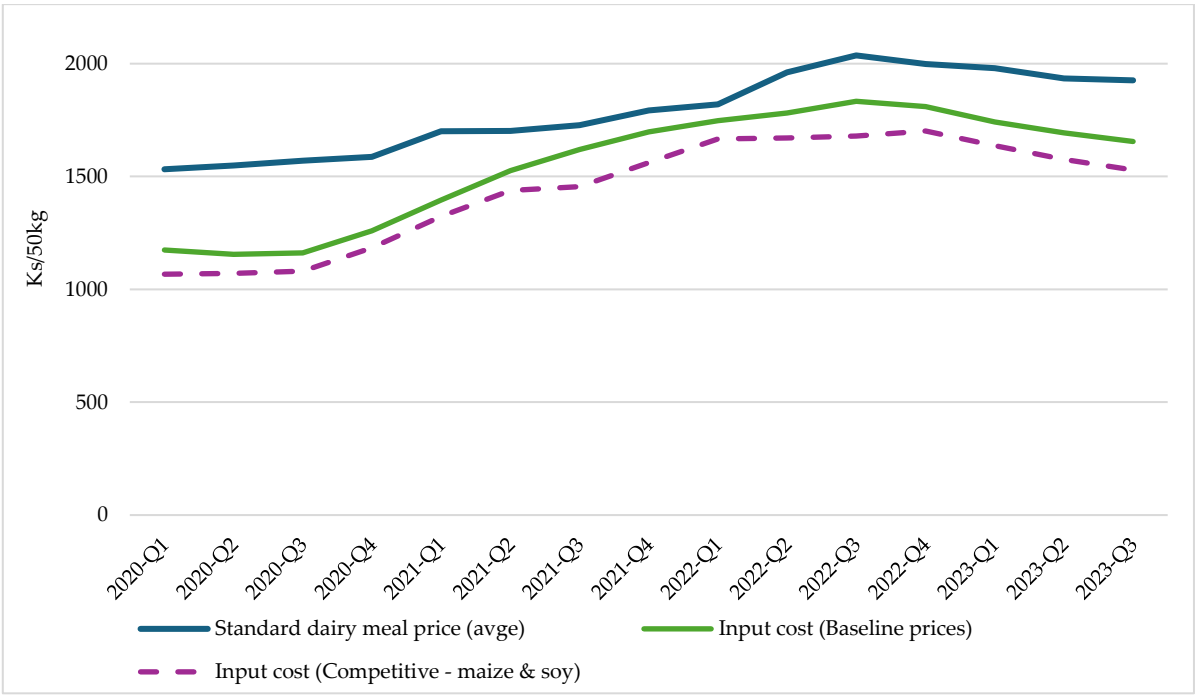


Figure 32: Costs and prices for standard Dairy Meal: imputed competitive soy and maize



6.4.2 Impact on margins and competitiveness of smaller companies

We consider the impact on smaller and non-integrated feed companies. The differential pricing of soymeal in particular in 2021 and 2022 impacts competitiveness in feeds that require a larger proportion of this input, that is, poultry feed, compared to dairy feed where it is less important.

The pricing across companies indicates that smaller companies were able to undercut larger feed companies in dairy feed (Figure A1). However, in layer and broiler poultry feeds (Figures A2 and A3) their prices are higher in response to higher input costs making them uncompetitive. In broiler pellets, the smaller companies appear to have elected not to supply for some months when faced with supplying at low or even negative margins for considerable periods.

The impact of higher input costs also depends on the ability to substitute alternative inputs. Non-integrated companies appear to have sought to use alternatives to the extent possible, while also restricting output and sales of some feeds requiring soymeal, meaning they were not effective competitors.

We have detailed data on inputs by feed product for a representative company from which we can consider substitutability. In poultry feed, there is very limited ability to substitute for the main proteins from soybeans and sunflowers.

With regard to poultry layer mash, while some substitution of full-fat soybean was attempted, it was very limited.[55] In addition, the proportions of soymeal were reduced by a relatively small amount (from an average of 170kg per metric tonne to around 140kg) (Figure 35). In broiler crumbs and pellets, there was a substitution of maize germ and some wheat by-products for maize grain, pointing to benefits from vertical integration with the milling of wheat and maize (Figures 36 and 37), and some substitution to full-fat soy. In dairy meals, there is much greater variation, with sunflower cake doubling in the later period while soymeal was removed altogether for some months (Figure 38).

[55] Full-fat soy is from mechanical extrusion, which can be done at smaller-scale, compared with soymeal from solvent extraction by large-scale regional crushers. There are some concerns with the higher oil content in the resulting feed and it still requires being able to source soybeans for the processing.

Figure 33: Standard layers mash input volumes, kg per tonne of feed

35a. Energy sources **35b. Protein sources**

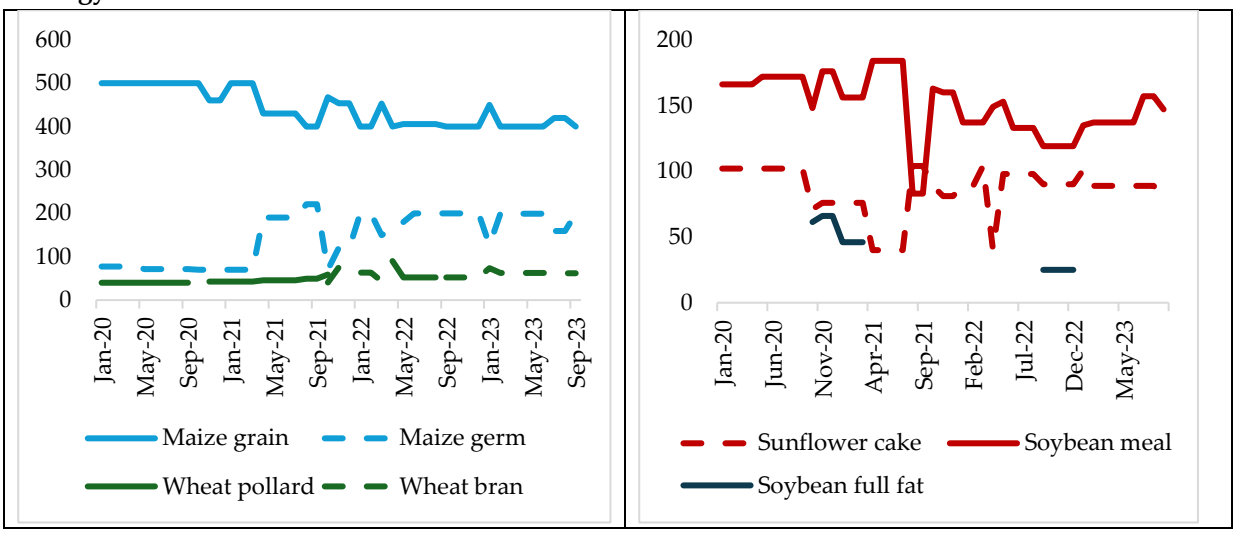


Figure 34: Broiler crumbs input volumes

36a. Energy sources **36b. Protein sources**

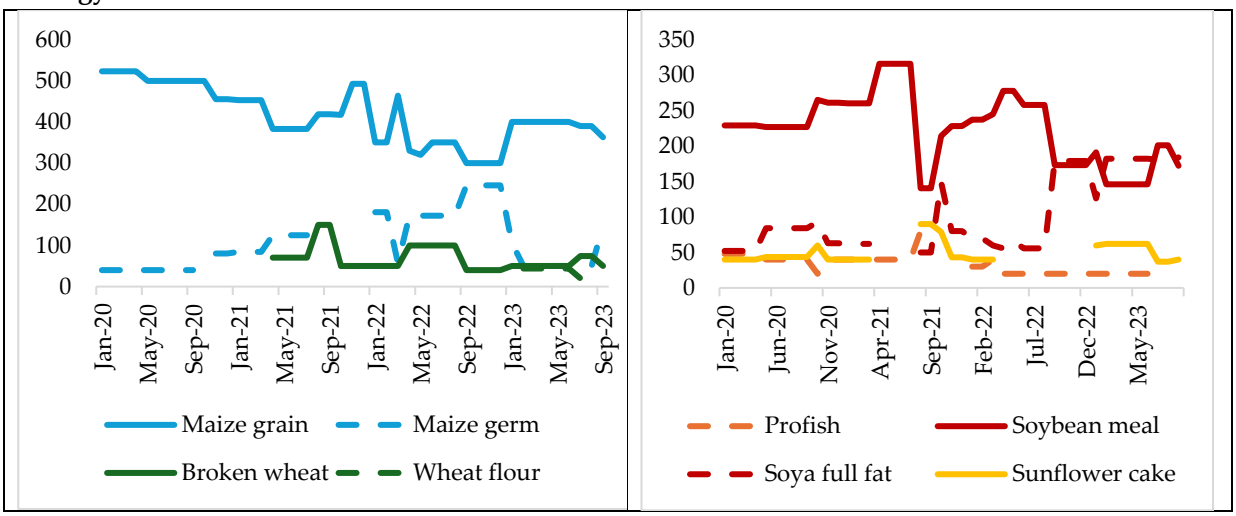


Figure 35: Broiler pellets input volumes

37a. Energy sources **37b. Protein sources**

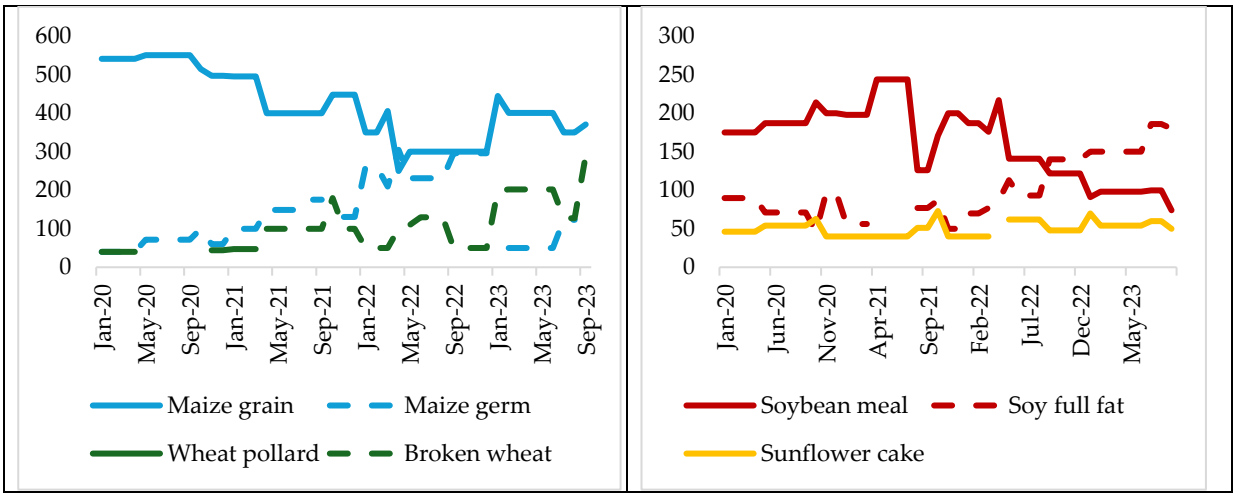
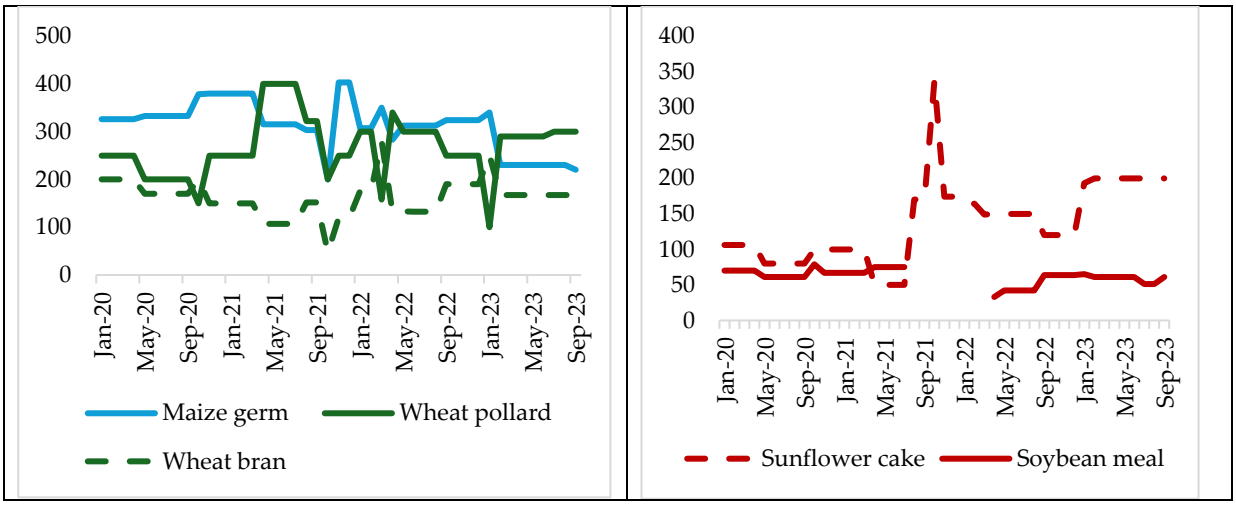


Figure 36: Standard dairy meal input volumes

38a. Energy sources

38b. Protein sources



The test for whether companies have been subject to a margin squeeze typically considers whether the vertically integrated firm or firms which are obtaining advantageous input pricing would be commercially viable if they had the same material input costs as the non-integrated firms being charged arms-length pricing. In other words, we assume all the other costs and scale economies of the large integrated firm except for the inputs on which differential prices have been charged. We compare the costs relative to the feed prices charged by the large integrated firm with which the non-integrated firms have to compete.

The assessment can be framed in terms of whether the conduct of the dominant firm (or group of firms) makes economic sense without there being an anti-competitive rationale. One way of addressing this is by examining whether the vertically integrated firm's downstream business would be commercially viable at the prices charged to independent businesses (Fumagalli et al., 2018). This is a test of whether the conduct is consistent with normal competition 'on the merits' or if it is unfairly undermining non-integrated businesses which are not viable even if 'as efficient' as the large integrated firm(s) (see Fumagalli et al., 2018; O'Donoghue and Padilla, 2006; OECD, 2009). Other variable and long-run incremental costs are normally included such as labour, electricity and packaging.

The prices for feed products are from the average of large companies, net of discounts and rebates, to major markets on an ex-factory basis.[56] The maize grain and soymeal and full-fat soy prices are those charged to medium non-integrated companies. The other costs are averages recorded by large companies, including packaging costs, labour and electricity, which are conservatively estimated at 4% of total input costs (note that as finisher pellets require a cooking process their production is more energy intensive). No account is taken of equipment repair, buildings or return on investment. The prices for layer mash and finisher pellets over the 12 months from July 2021 to June 2022 are less than the variable cost meaning a negative margin. To stay in business, firms will further have to cover the fixed costs and earn a return.

Table 6: Estimates of margin squeeze on medium/small feed producers, July 2021 to June 2022

Per tonne of feed (Ksh)	**Layer mash**		**Finisher pellets**
Price, ex-factory	49801		65811
Maize grain	17146	Maize grain	18559
Maize germ	1846	Maize germ	994
Wheat pollard	1102	Wheat pollard	1102
Sunflower cake	3423	Soybean meal	19976
Soybean meal	19329	Soy full fat	10988
Premixes and Additives	4575	Sunflower cake	1544
Other (labour, electricity, packaging)	2617	Premixes and Additives	11232
		Other (labour, electricity, packaging)	3296
Total variable costs	50038	Total variable costs	67689

[56] We understood from the interviews that there may be additional rebates and distributor commissions given. We include a conservative estimate of 2% reduction in the ex-factory prices to account for this.

6.5. Competition concerns

There are high levels of concentration in important inputs into animal feed sector and, although to a lesser extent, in animal feed markets, especially in narrower geographic and product market segments. There is also vertical integration of some producers from inputs to feed, and further into animal products.

Three main categories of competition concerns have been identified in the Inquiry, based on the assessment of the market structures and outcomes. We weigh up the evidence on each below, albeit constrained by the responses received to information requests.

1. Feed manufacturers in Kenya have been charged supra-competitive input prices that do not reflect actual product availability

- Surplus volumes have been exported from Kenya to maintain the supra-competitive prices, by traders and large processing companies.
- Coordination may be facilitated through various mechanisms, including regional information exchange.

2. Discrimination on inputs and margin squeeze against non-integrated feed manufacturers

- There has been differential pricing on some inputs between the very few large animal feed companies in Kenya with regional linkages and the majority of feed suppliers.
- These inputs are controlled in terms of volumes and prices to different customer groups by the major suppliers.
- The margin squeeze on smaller producers forces them to either exit the market or remain as small fringe which cannot exert a competitive threat.

3. Market division in the feed market

- Possible market division by geography across broad regions, monitoring shares in each region as well as at the national level.
- Price leadership and delivery prices of inputs by main companies increasing transparency.
- Smaller local producers to keep within their territories.

There are additional concerns about market and regulatory failures, especially in cross-border regional markets, and these have had large effects on maize prices, in particular.

6.5.1 High input costs undermining Kenyan producers and contributing to high food prices

Feed producers in Kenya rely on imports for many of the most important constituents. The supply market of these constituents is, however, highly concentrated. There are only four large-scale

producer groups of soymeal, and three producers of sunflower cake (two of whom are also soybean processors) in the region, to supply to Kenyan animal feed companies. We estimate concentration as measured by the Herfindahl-Hirschman Index (HHI) to be more than 2000 for soymeal, and higher for sunflower cake, which makes both of them highly concentrated.[57] For milling by-products of wheat, the suppliers are the flour millers who are relatively concentrated with three companies accounting for around half of the market. Animal feed premixes are supplied internationally with around three to four major suppliers in Kenya.

The increased input costs for the period from 2021 to 2022 had a significant impact on feed producers in Kenya. The sharp increases in soymeal had the biggest effect overall given its importance in poultry feed. Extremely high maize prices have also significantly impacted on the competitiveness of animal feed.

We have found that the pricing of soymeal to Kenyan feed companies neither reflect supply and demand conditions in competitive markets, nor does it reflect the somewhat higher world prices for this traded product. At the same time, as prices to Kenyan feed companies doubled from early 2021 to over US$1100/tonne (or Ksh. 120/kg) in Q4 of 2021, soymeal was being exported from Zambia to South Africa at US$470/tonne net of transport costs, and by Malawi in large volumes to countries outside Africa at lower prices than prevailing in Kenya.

The higher prices to Kenya reflect supra-competitive mark-ups on soymeal (as well as full-fat soya), to medium and small-sized feed producers after taking transport costs into account, of close to 100%, and even to large producers of well over 50%.

Maize prices have been substantially higher than justified by prices paid to farmers – in Kenya and neighbouring countries – and as recorded by traders. While maize prices to feed producers increased to over Ksh. 60/kg in 2022, prices in other countries across the region, and being paid to farmers in Kenya, were substantially lower. The high maize prices in Kenya have also increased, although to a lesser extent, prices of maize by-products such as maize germ.

The mark-ups in maize prices appear to be related to trade restrictions and issues such as standards and certification. Across East Africa region, there are excellent conditions for substantial expansions in maize production for animal feed, and not in competition with maize for human consumption. There are also extremely good conditions for expanding the production of soybeans and sunflowers. This is reflected in the export competitiveness of soymeal even as the prices charged to Kenyan customers are extremely high.

[57] See, for example, US Dept of Justice, https://www.justice.gov/atr/herfindahl-hirschman-index .

The excess mark-ups and the failures to build good regional linkages from agriculture to feed production have undermined feed and livestock in Kenya. Input costs to Kenyan feed companies have been an estimated Ksh. 3 billion per annum higher for poultry producers. Turning this around requires addressing the competition issues head-on, along with an appropriate policy framework for growing a competitive industry across the region.

Indications of coordination

The oligopolistic conditions for relatively homogenous inputs, and market outcomes which are inconsistent with normal and effective competition, point to possible coordination between suppliers.

We draw on the relevant literature to assess whether there are 'red flags' and the next steps that could be taken in this regard (as set out in section 1 and relevant literature, including Marshall and Marx, 2012; Harrington, 2008).

First, we consider structural features. There is a high level of concentration across the region in the processing of soybeans and sunflower to supply meal and cake for feed with four large company groups in the region as a whole, of roughly the same size. There is multi-market contact between these companies and vertical integration into feed and poultry (as well as horizontally into vegetable oil). The products are relatively homogenous and have to meet the feed specifications, especially for poultry feed. There are major barriers to entry to supply some inputs with scale economies highest in processing soybeans, where the minimum efficient scale for crushing to produce soymeal is around 70-100th tonnes per annum.

Vertical integration may provide advantages for some companies in accessing inputs and/or sales of outputs, whereas this may also provide opportunities for monitoring and coordination of market outcomes. In this regard, we note that [redacted]. There appear to be relationships of some feed producers with cross-border producers of inputs such as soymeal and sunflower cake which may enable them to access the inputs on more favourable terms. Other feed companies rely on intermediaries in form of brokers and traders which increase final prices paid by end-buyers.

The role of brokers and traders appears to be important in this regard, but remain rather opaque. Brokers did not respond to requests for information sought. However, the insights we obtained in the process of the Inquiry raise concerns about their role as possible gatekeepers for key inputs, as follows:

- [redacted]

Second, we consider behavioral features. These have to do with market outcomes, arrangements, and interactions that differ from what would prevail under normal and effective competition.

As observed, the pricing and trade flows of some of the main feed inputs raise significant concerns as it is not consistent with expectations of competition. In other words, there are sales to customers outside Kenya at considerably lower prices than to animal feed companies in Kenya. This points to concerns about arrangements at a regional level. Exporters achieving lower prices in markets outside the region (after subtracting all the transport costs to supply) have an incentive instead to supply Kenyan feed companies, which would compete prices down in Kenya in line with the regional export prices. Prices to buyers in Kenya have been at high levels as if there was scarcity of feeds across the region, instead of a surplus.

As the entities are legally registered in Kenya, the Authority could obtain the relevant information, even though, the companies did not comply with the RFIs issued under the inquiry.

The outcomes point to the need to understand the arrangements by which volumes of soymeal and beans are exported from Zambia and Malawi, the countries with the largest net exports over the period. In the case of Zambia, the exports appear to be monitored through the issuance of export licenses, in which the industry association in that country (in which multinational firms supplying Kenya are also members) has been involved (Kaonga et al., 2023: 21). The same companies are present in Malawi, along with [redacted].

6.5.2 Small producers are squeezed and excluded

Very few large animal feed producers account for the majority of the commercial feed supplied in Kenya, of which an even smaller number are vertically integrated and/or have long-term relationships with regional suppliers of key inputs. These producers have been shielded to an extent from the input price increases. The large companies have not fully complied with the information requests to enable an assessment of the transaction prices, including through various intermediaries. The large input suppliers appear to sell to major feed companies, including those with which they share common owners, through various traders and brokers. This means that the arrangements governing this trade relations and the terms on which it is conducted are extremely opaque.

Smaller and medium-sized animal feed companies that buy feed inputs on an arms-length basis and rely on effective competition in the supply of these products have been squeezed. We have established that they have been subject to a margin squeeze in poultry feed over the twelve (12) months to June 2022 based on variable costs being higher than the ex-factory prices of poultry layer mash and finisher pellets. Margins have also been very low in other poultry feed categories. This finding is consistent with feed producers exiting the business altogether, mothballing their operations or exiting some product categories such as broiler feeds.

At the same time, the fastest growing area on the demand side is for broiler chicken, which ought to be among the cheapest sources of affordable protein.

6.5.3 Market outcomes in feed markets

In animal feed markets in Kenya are relatively concentrated. Based on responses by companies, the largest four firms account for around 75% of the national supply of poultry and dairy feeds. Concentration is higher in important product categories such as poultry broiler feeds where the two leading suppliers account for a share of national supply well above 50%. Within poultry feed, layer feed appears to be somewhat less concentrated. In dairy meal, there are more medium and small-scale commercial suppliers. Limited data availability prevented the assessment of sub-national geographic markets.

Interview responses and the incomplete information submitted pointed to some concerns relating to competition in downstream feed markets.

The practice of setting uniform prices across the country in effect means that pricing is not cost-reflective. After taking into account the low transport costs for areas close to the factories of feed producers it means that customers in these areas are charged higher prices than those in the far-flanged markets. Conversely, it means that feed companies will have to absorb the higher transport costs to supply further afield customers, especially for smaller feed companies whose costs have already been inflated by high prices of inputs.

To maintain price differential relative to costs to different geographically located customer segments requires restrictions to be placed on feed distributors. In the absence of such restrictions, distributors supplying feed for a further local market and receiving a bigger discount have an incentive to sell it in the nearer market from which it can fetch a higher margin. Field interviews with smaller companies and distributors pointed to existence of restrictive arrangements where companies were expected to stay in their designated territories.

The data obtained on sales volumes and capacities indicates that firms are operating at substantially below capacity. It is unclear why this is the case, with possible explanations having to do with access to inputs. A proper assessment of the nature of competition requires market shares over time, including by-product and geographic market segments. However, inadequate responses to the requests for information meant this could not be satisfactorily assessed, even at the national level for all animal feed.

The role of the main industry association AKEFEMA is mainly focused on engaging with the government and promoting the industry.

6.6. Implications of market outcomes for economic development

The prices for feed in Kenya are much higher than for other countries such as South Africa and Brazil (as reflected in Figure 21). Broiler feed prices in Kenya were some 42-54% higher than in South Africa and Brazil for the period 2021 to 2023. The prices in Kenya were also higher than in Malaysia under

a cartel, while also noting that Malaysia is dependent on imports of maize and soymeal for its animal feed.

The clear implication is that, despite animal feed inputs being abundantly available in the region over the period, the feed prices have been extremely high making producers of poultry, dairy, and other livestock uncompetitive. The high feed prices raise the costs of food producers and increase food prices in Kenya for poultry, eggs, milk, fish, beef, and pork products.

The main cause of the high feed prices is the prices of important inputs which have been considerably higher than in competitive well-functioning markets. There is a much wider effect in that economic development, growth, and employment are undermined, as Kenya livestock producers are uncompetitive, resulting in lower levels of output, investment, and employment. This consequently makes animal feed producers in Kenya uncompetitive, increasing food prices, particularly for poultry.

Building resilience to climate change also urgently requires better functioning regional markets. The effects of extreme weather events and variability that affect different parts of the region from year to year can be ameliorated by good production and trade from regions with good growing conditions. East and Southern Africa have abundant land with good soils and water, if the appropriate measures are in place to support farmers and for the produce to be traded regionally at fair prices. The Inquiry has observed exactly the opposite effect occurring in practice – with extremely high prices being charged for regionally traded products which is abundant supply in some regions.

In addition, the animal feed market is characterized by differentiated inputs prices with squeezed margins for medium and small producers in comparison to large, well- established producers. The effect has been undermined smaller feed producers, some of which exited the market. Equally, there is evidence of smaller producers sticking to supplying particular regions denying them the opportunity to expand their markets reach and provide competitive pressure, which would benefit consumers through competitive pricing and wider product variety.

There are major challenges with the regulatory framework which has not supported competitive regional markets, especially for inputs. Instead, obstacles to trade have been exacerbated by failures in standards and *ad hoc* trade restrictions. Within Kenya, for example despite supportive animal feed production policies, the costs are increased by county-level costs of trade, fragmenting the country and undermining competitive geographic markets. With the combination of competition and regulatory policies, Kenya can realize much better-priced animal feeds. This requires tackling apparent anti-competitive conduct and supra-competitive pricing of inputs such as soymeal and sunflower cake.

The steps to tackle anti-competitive conduct must be accompanied by measures to improve trade and regulations to realize the potential for growing the Kenyan animal feeds sector and indirectly reducing food prices through a combination of steps:

- Increased regional production of inputs particularly for soya beans and sunflower
- Improved logistics for both inputs and feed products to ensure improved availability and sustainability in supply of the same. Equally regulatory barriers to the movement of inputs should be reviewed and streamlined. This is not only across borders but across counties in Kenya, particularly in terms of inter-country transportation charges.
- Improved and consistent regional standards particularly on aflatoxin regulations

The growth opportunity being foregone is enormous, especially considering the value-added and employment in livestock production to meet growing demand.

7. Conclusion and recommendations

7.1. Conclusion

Kenyan animal feed prices have been much higher than under effective competition. This raises major concerns that have been identified in cross-border markets for animal feed inputs.

There has been abundant production in the region with substantial exports of key inputs, notably soybeans and soymeal, and yet prices to Kenya feed producers have increased way above the prices on exports into international markets outside of East Africa. This is a strong indication that exports have been coordinated to short the Kenyan market and indeed the region. There are high levels of concentration in processing of soybean and sunflower regionally, to produce the meal and cake required by animal feed companies.

Brokers appear to play an important intermediary role in the supply of animal feed inputs, yet their operation remain opaque. With a few exceptions, information was not provided neither by brokers, nor by suppliers of the main inputs.

The increased input costs from 2021 to 2022 had a significant impact. Overall, the sharp increases in soymeal had the biggest effect given the importance of poultry feed. Extremely high maize prices have also impacted significantly on the competitiveness of animal feed with maize prices in Nairobi and environs being way above prices in supplying areas, within Kenya and in neighbouring countries. In maize trading, there are concerns about the application of standards across the region, especially to ensure maize is free of aflatoxin, and of *ad hoc* trade restrictions.

Available data and interviews with feed producers indicate that the smaller and non-integrated feed producers are discriminated against in terms of pricing and supply of key inputs. This has had net effect of margins squeeze to the extent that efficient smaller producers were loss-making in some months due to the inflated input costs relative to end-buyer prices.

Feed production is relatively concentrated in Kenya with the two largest producers accounting for more than half of poultry feed supply (although data gaps hampered better measurement). Moreover, the large producers are integrated to differing degrees into upstream inputs and downstream poultry production. They are also part of regional and multinational corporate groupings. New entrants that are integrated to differing degrees into inputs and downstream livestock have the potential to reduce concentration levels and increase competition, if they are able to challenge incumbents and not coordinate with them.

There are some concerns about the effectiveness of competition in downstream markets for feed in Kenya with reports of territorial divisions between medium-sized producers and possible price leadership from the largest companies.

Kenya requires effective trade within the country and across borders for the growing demand for animal feed to be affordable at reasonable prices. Market failures and regulatory barriers, which undermine the increase in the obstacles and costs of transporting feed and its inputs, need to be addressed. These include cess charges levied by County governments within Kenya. Fragmenting markets within Kenya and the region reduces competition and in turn translate in higher food prices.

The effects of uncompetitive markets on food prices are very substantial, as are the effects of undermining value-added and employment in the animal feed industry and livestock production.

7.2. Recommendations

i. Repositioning the animal feed industry in Kenya to realize its potential for rapid growth to meet demand, and create value and create employment, would mean addressing a combination of factors.
ii. There needs to improve cross-border markets and consistent regulations in order to ensure competitively priced inputs and also facilitate trade across COMESA and EAC.
iii. Within Kenya, the fragmented markets due to county taxes and impediments to the free flow of goods must be addressed. These taxes impose a wedge within Kenya between the prices received by producers of inputs and the prices paid by animal feed companies. The prices charged to animal feed customers are further increased, especially where customers are located in different counties far away from the main production locations.
iv. The Authority should continue to monitor the animal feed markets, including in collaboration with government and regional bodies, to assess whether feed prices in Kenya diverge or converge with international feed prices. Further, the Authority should take appropriate action and intervene in markets where there are likelihood of concerns about market conducts are uncompetitive. KAMIS may include soymeal and animal feeds in the basket of products being monitored in Kenya.

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