

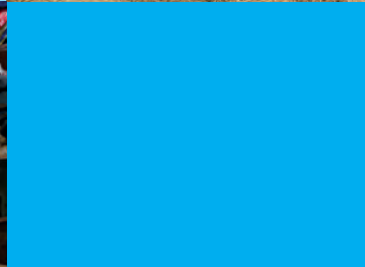
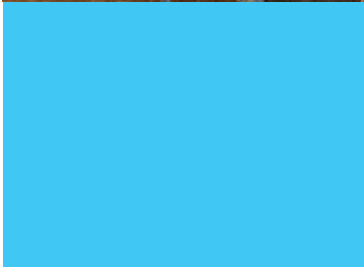


IMMPEX



THÜNEN

IMMPEX: Impact of Meat and Dairy Exports on Developing Countries



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Janine Pelikan and Claus Deblitz

The export of poultry and dairy products from the EU to Africa is often the subject of critical discussions. Headlines in the media include “Ghana’s poultry farmers suffer from EU imports”¹ and “Export of milk powder deprives West African dairy farmers of livelihood”². Europe supplies significant quantities of chicken parts and milk powder to Africa and media and Non-Governmental Organisations (NGOs) in particular are calling for responsible policies on exports.

In order to better understand how German and European exports affect African countries, the German Federal Ministry of Food and Agriculture commissioned the Thünen Institute to carry out the IMMPEX project. “IMMPEX” is the abbreviation for “Impact of Meat and Milk Product Exports on Developing Countries”.

The aim of the research project is to investigate the effects of German and European exports on the agricultural sectors in Ghana and Senegal. The following questions arise:

- ◆ What exactly is exported?
- ◆ How much is exported?
- ◆ What effect do the exports have locally?
- ◆ How competitive is local poultry and milk production?
- ◆ What preferences do consumers have?
- ◆ What measures can be taken to avoid possible negative effects of German and European exports?

In the public debate in Germany, it is mainly the negative effects of exports on producers in Africa that are criticised.

1 DW: 11.06.2019

2 Elite-Magazin: 16.07.2015



Group picture in Accra, Ghana

On the demand side, however, the exports lead to a greater availability of poultry meat and dairy products at lower prices. In the IMMPEX project, we therefore look at both the supply side – i.e. the level of producers – and the demand side – the level of consumers. These analyses are complemented by a consideration of the entire value chain. In addition, we present the current agricultural and trade policy framework and conduct impact assessments of possible alternative policies.

Over a period of 3.5 years, we conducted surveys and collected data in cooperation with local actors. The results were discussed with stakeholders in Ghana and Senegal in several workshops. Many of the results have already been published in scientific journals. This final report summarises the key messages of these publications.

In chapters 2 and 3, we analyse trade data and present existing agricultural and trade policies in Ghana and

Senegal. In Chapter 4, the focus is on the poultry sector. Here we present results on farm competitiveness, value chains and consumer preferences and attitudes, the latter using results from a previous project. Therefore, chapter 4.3 contains results of a dissertation on “Consumer preferences for poultry meat in Ghana”. The dissertation project was handled by Collins Asante-Addo and formed the first building block for the IMMPEX project. Similarly, Chapter 5 summarises the analyses on milk and dairy products. Finally, in Chapter 6 we present the results of our policy impact assessments.

Capacity development, knowledge-sharing and partnerships

Craig Chibanda

The IMMPEX project also had a capacity development and knowledge-transfer component in addition to its research goals. Thus, the project provided a platform for capacity development through knowledge and experience sharing among actors in the poultry and dairy sectors in Ghana, Senegal, and Germany. In order to accomplish this, several workshops and field trips were conducted.

We organised kick-off workshops in Ghana and Senegal at the beginning of the IMMPEX project. In each country, around 45 actors from the poultry and dairy sectors attended the workshops to discuss the key issues in the

sectors and learn more about the project. Through the workshops, we were able to engage the key actors in the sectors and the actors were able to interact with one another.

Almost three years into the project, we organised a knowledge sharing workshop in Braunschweig on 12 to 16 September 2022. The workshop enabled participants to share their experiences and learn from each other. It brought together ten participants from Ghana and Senegal, including representatives of producer and consumer organisations, processors and researchers. Additionally, the participants visited German poultry and dairy farms and chicken slaughterhouses. The field visits provided the participants with an opportunity to exchange knowledge and experiences with German producers and processors. The exchanges were mainly focused on the differences in animal husbandry practices, technologies and investments on farms and slaughterhouses.

At the end of the project, in 2023, we organised “Closing workshops” in Ghana and Senegal. The workshops were organised to present the final results of the IMMPEX project. They also offered a forum for exchanging perspectives on how the results might be incorporated into policies, programs, and farm practices. A wide range of stakeholders in the dairy and poultry sectors attended the workshops, including policymakers, representatives of producer and consumer organisations, processors and researchers.

The IMMPEX project also provided the opportunity to work with research institutes in Ghana and Senegal. Within the project, we collaborated with the CSIR-Science and Technology Policy Research Institute (STEPRI) in Ghana and the Bureau d'Analyses Macro-Economiques (BAME) in Senegal. Through the collaborations, the institutes were able to jointly collect data and publish research together.



Group picture in Dakar, Senegal



Dairy cattle in Senegal

- ◆ The EU is the main exporter of poultry meat and dairy products to West Africa. EU's market share and total trade with these products have increased strongly in recent years.
- ◆ In West Africa, Ghana and Senegal are major importers of German and European dairy products.
- ◆ In Senegal, there is an import ban on poultry meat, while Ghana imports nearly 80 % of its domestic consumption.
- ◆ From 2006 to 2018, poultry meat production increased by 119 % in Ghana and 233 % in Senegal. In contrast, dairy production in both countries remained relatively constant over the same period.

Omid Zamani, Janine Pelikan, Johanna Schott

Background and aims

This chapter summarises the first work package of the project IMMPEX. In this project, we analyse the effects of German and European exports of poultry and dairy products on the agri-food sectors in Ghana and Senegal. The aim of the project is to develop and evaluate measures to avoid or reduce undesirable effects of these exports. In the first work package of IMMPEX we analyse the trade flows from Germany and the EU to Africa and define additional criteria for the selection of the two African project countries.

Approach and country selection

For our study, we selected the poultry and dairy sectors of Ghana and Senegal. The analysis of trade data shows for both countries that the import volume and market share of German and European livestock products are particularly high. Media and Non-Governmental Organisations

particularly report on problems with European poultry imports in Ghana and dairy product imports in Senegal. In addition to that, existing policy measures encouraged us to choose these countries. Ghana, for instance, imposes a 35 % tariff on poultry imports. In contrast to this, Senegal implemented a ban on poultry imports in 2006. Moreover, we used additional criteria like feasibility, data availability, and accuracy as well as findings from previous studies to select the research countries.

Key findings

The EU is the main supplier of **poultry meat** to West Africa, ahead of the USA and Brazil. Among different types of poultry meat, frozen chicken cuts and frozen whole chickens accounted for 84 % of the quantity of all poultry exports to West Africa in 2017. According to the United Nations trade statistics, poultry meat exports of the Netherlands and Belgium make up nearly half of the quantity of all EU poultry meat exports to West Africa.

Germany exported 8,000 tons of poultry meat to West Africa in 2017. Ghana and Benin are the main importers of German poultry meat. However, the largest share of Benin's poultry meat imports is formally and informally diverted to neighbouring countries such as Nigeria. Additionally, Germany exported 547,000 tons of live fowls to the Netherlands for slaughtering. From there, mainly boneless parts and whole chickens are re-exported to Germany. It is likely that the remaining parts, including legs and wings, are being exported as Dutch exports to West Africa.

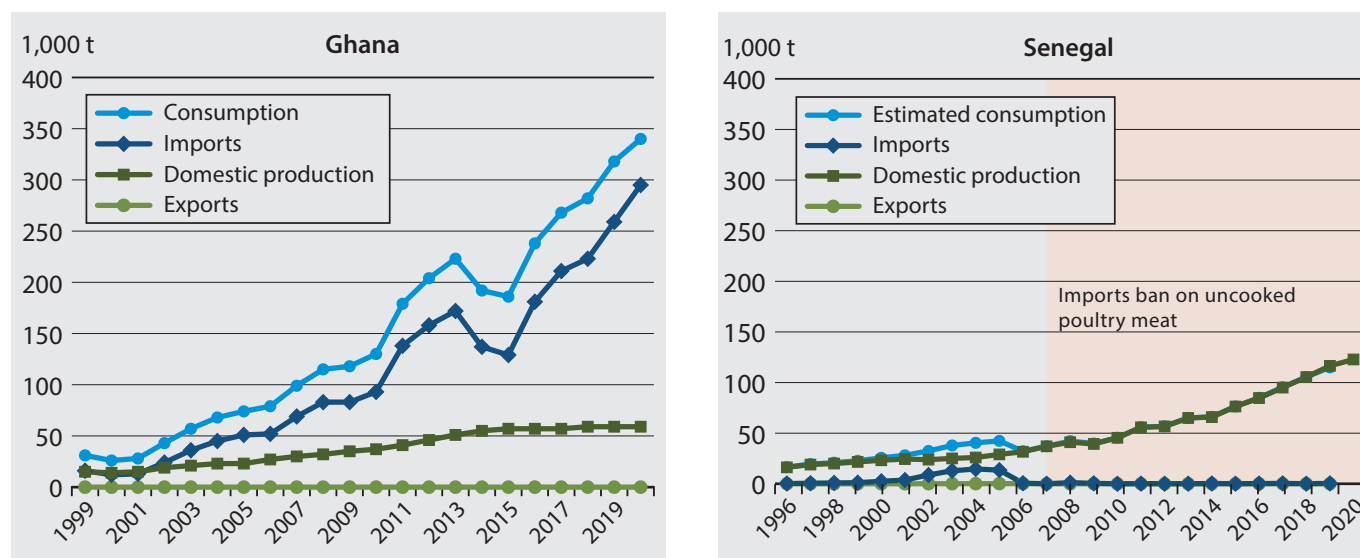
Total imports in Ghana accounted for nearly 80% of the Ghanaian poultry meat consumption in 2018. The share of imports in domestic consumption of poultry meat in Ghana has increased sharply during the last decade. While domestic production increased by 119%, imports rose to

a much higher degree from 2006 to 2018 (Figure 2.1). As a result, the self-sufficiency rate fell from 34% in 2006 to 21% in 2018 – even though domestic production more than doubled in this period.

We found an opposite pattern in Senegal. As a result of the import ban, the self-sufficiency rate for poultry meat reached almost 100%. Between 2006 and 2018, domestic production in Senegal increased by 233%, which is significantly more than in Ghana in the same period.

With population growth and accompanying increase in consumption, **milk and dairy products** are gaining in importance in West Africa. In 2017, more than 65% (equal to 1,078 million US Dollars) of West Africa's dairy imports came from the EU. The EU exported mainly milk

Figure 2.1: Development of the Poultry Meat Sector in Ghana and Senegal



Source: Zamani et al. (2021), UN Comtrade (2018), USDA (2019).

powder and milk powder preparations to West Africa. These product groups accounted for 73 % (equal to 884 million US Dollars) of all dairy exports in 2017. In the same year Nigeria, Senegal, and Ghana were the largest importers of German dairy products.

Total dairy imports of Senegal amounted to 240 million US Dollars in 2017 (equal to 550 million tons milk equivalent), of which 85 % was milk powder and milk powder preparations.

The reason for this is increasing domestic consumption: Per capita consumption increased from 25.9 to 53.1 kilograms of milk equivalents between 1996 and 2018.

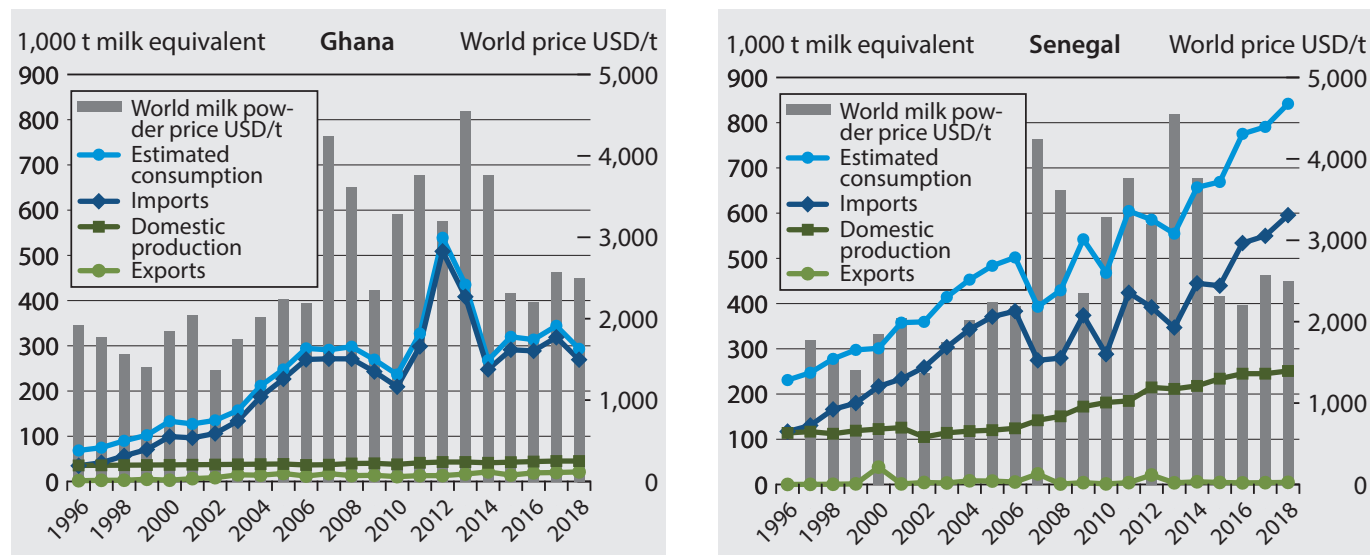
However, the self-sufficiency rate of the Senegalese dairy sector has steadily declined until 2018 (Figure 2.2). A country comparison shows that local milk production is more important in Senegal and starts from a higher level than in Ghana, where domestic production is low.

Data from two decades show a strong increase on the import side for both countries and marginal growth in domestic milk production.



Dairy cattle in Ghana

Figure 2.2: Development of the Dairy Sector in Ghana and Senegal



Note: Milk equivalent is the quantity of fluid milk used in a processed dairy product.

Source: Zamani et al. (2021), UN Comtrade (2018), FAO (2018), OECD (2018).



Broiler chickens in Senegal

Literature

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3 Policies in the Poultry and Dairy Sectors in Ghana and Senegal

- ◆ Domestic policy interventions in Ghana are more targeted to the poultry meat sector than the dairy sector, while in Senegal it is the other way around.
- ◆ Trade policies in Ghana and Senegal have mainly aimed at limiting imports through measures like import bans and tariffs, and protecting the domestic sector against outbreaks of diseases.
- ◆ Ghana protects the poultry meat sector with a tariff rate of 35 %. Senegal has been experiencing a total poultry import ban since 2006.
- ◆ Genetic improvement policies have been considered as the preferred strategy in the dairy sector in Senegal. In Ghana, domestic dairy policy measures are limited.

Omid Zamani, Mavis Boimah, Craig Chibanda, Anoma Gunarathne, Janine Pelikan

Background and aims

This chapter reviews the main policy interventions in the dairy and poultry sectors of Ghana and Senegal using literature analysis and official documents. Moreover, it attempts to elaborate on the interaction between different policy objectives.

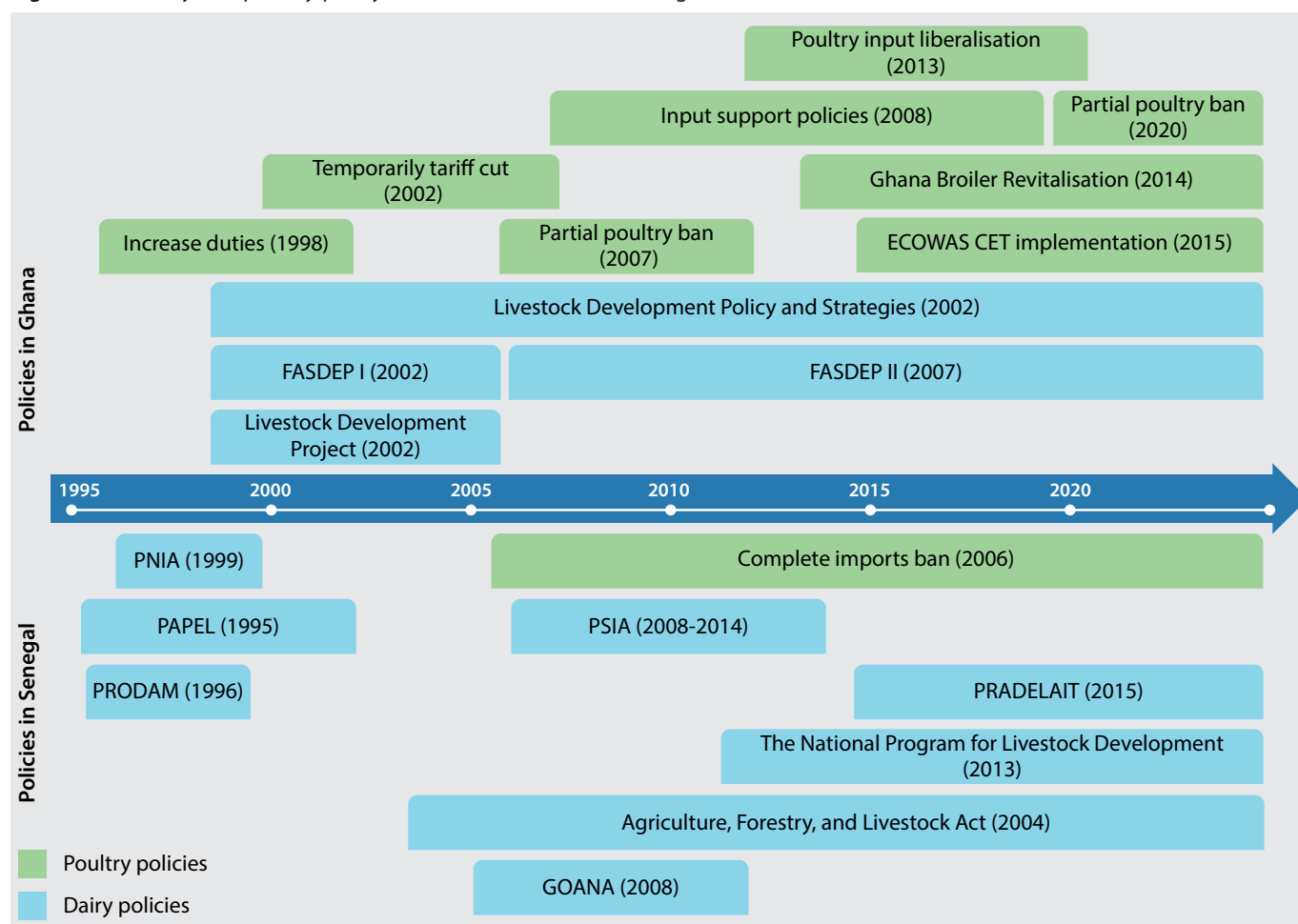
Key findings

The policy interventions in both countries can be generally categorised into trade policies and domestic agricultural policies. The trade policies have mainly aimed at limiting imports through trade restrictions and also protecting the domestic sector against outbreaks of diseases. Domestic agricultural policies on the other hand have targeted increasing domestic production. Figure 3.1 presents the main policy interventions in the poultry and dairy sectors of Ghana and Senegal.

Poultry meat trade policies

The Ghanaian trade policies have mainly attempted to a) improve the competitiveness of domestic poultry production by liberalising the input market and thereby reducing the cost of production, and b) limit poultry meat imports through trade restrictions (tariff policy and partial trade ban). In 2015, Ghana fully implemented the Common External Tariff (CET) of the ECOWAS (Economic Community of West African States), in the framework of which the applied tariff rate on poultry meat imports was raised from 20 % to 35 %. Within the ECOWAS, tariffs are no longer levied. As a WTO member, a bound tariff of 99 % indicates that Ghana could increase the tariff rate that far. Furthermore, in 2014, the Ghana Broiler Revitalisation Project (GHABROP) was launched to regulate imports of meat products aimed at protecting domestic broiler production for ten years. Under this policy, the import of poultry meat was limited to 60 %, and the importers were committed to buying 40 % of their products from local producers.

Figure 3.1: Dairy and poultry policy timelines in Ghana and Senegal



Source: Own presentation.

In 2020, the government again imposed a partial ban on poultry product imports from four European countries and Russia that reported outbreaks of Avian Influenza. The key objective of the partial bans was to protect the domestic poultry sector from Avian Influenza. Therefore,

they were subsequently lifted when the threat of Avian Influenza outbreaks had decreased. The most recent trade policy is related to a bilateral interim Economic Partnership Agreement (iEPA) with the EU according to which Ghana will gradually remove its import duties

of 78 % on EU exports in the period from 2020 to 2029. Based on this iEPA, poultry meat is excluded from liberalisation. Senegal has been imposing a ban in 2006 on the import of live poultry, edible poultry meat and offal, and poultry products to prevent Avian Influenza from entering the country and supporting local producers. Albeit infrequent, Senegal imports some day-old chicks when there are market shortages. Senegal is also a member of the ECOWAS and implements the CET. Without the ban, therefore, the applied tariff would be 35 %. As a WTO member, Senegal has a bound tariff of 30 %. This would be a challenge for the Senegalese policymakers for the period when the trade ban is lifted. The ECOWAS member states are negotiating to find solutions for these inconsistencies.

Domestic poultry policies

Increasing production to meet domestic demands seems to be the fundamental purpose of the domestic policy interventions in Ghana. Ghana implements programs



Broiler chickens in Ghana

combating poultry diseases, subsidies on feed production, training and extension programs, and the distribution of day-old chicks. Among these policies, combating poultry diseases has been the only consistent poultry policy that has been pursued by the Ghanaian government. High feed costs are another key challenge facing the poultry sector. To promote maize production as the main ingredient of livestock feed, several initiatives have been implemented since 2007, including a Fertilizer Subsidy Program (from 2007 to 2008), Block Farms Program (in 2009), and the National Food Buffer Stock Program (in 2010).

Dairy trade policies

According to the ECOWAS CET, imports of liquid milk, milk powder, and full-fat milk are taxed in Ghana and Senegal at various rates, from 5 % (mainly for powdered milk) to 20 % (mainly for liquid milk and processed milk products). In contrast to the poultry sector, dairy products are supposed to be liberalised in the next few years, according to the iEPA.

Domestic dairy policies

Since 2002, the implementation of dairy policies was mainly based on a roadmap specified in the Ghana Livestock Development Policy and Strategy, which has two main objectives: first, to enhance the supply of meat, livestock, and dairy products from domestic sources; second, to improve access to livestock markets, services, and value addition.

This policy set is defined under the first and second Food and Agriculture Sector Development Policies (FASDEP I and II) which were formulated as a policy framework for guiding the development and interventions in the Ghanaian agricultural sector. In Senegal, several operational plans

and projects have been implemented in which livestock is identified among the priority sectors. These programs include the National Program for Livestock Development (PNDE), and the Grand Agricultural Offensive for Food and Abundance (GOANA) (Figure 3.1). Artificial insemination has been widely supported by successive national programs including the Livestock Support Project (PAPEL), the National Artificial Insemination Program (PNIA), and the Dairy Industry Development Support Project (PRAD-ELAIT). The main public intervention regarding genetic improvement was implemented under the Special Artificial Insemination Program (PSIA) in 2008.

Conclusions

- ◆ In Ghana and Senegal, domestic policy measures in the dairy and poultry sectors aim at increasing domestic production through a reduction in production costs. The Ghanaian government has actively intervened in the poultry sector, while the Senegalese government has mainly targeted the dairy sector.
- ◆ The complete ban is the main policy in the poultry sector of Senegal. However, as a member of WTO, Senegal is supposed to lift the ban when the risk of an Avian flu outbreak drops.
- ◆ Policymakers should account for possible interactions between the discussed policies in the form of synergies and trade-offs. For example, imports might affect food security while having a negative effect on domestic production. Figure 3.2 summarises potential synergies and trade-offs between poultry and dairy policies. The policy objectives are reflected by SDG 1 (no poverty), SDG 2 (zero hunger), SDG 6 (clean water), and SDG 8 (decent work and economic growth).

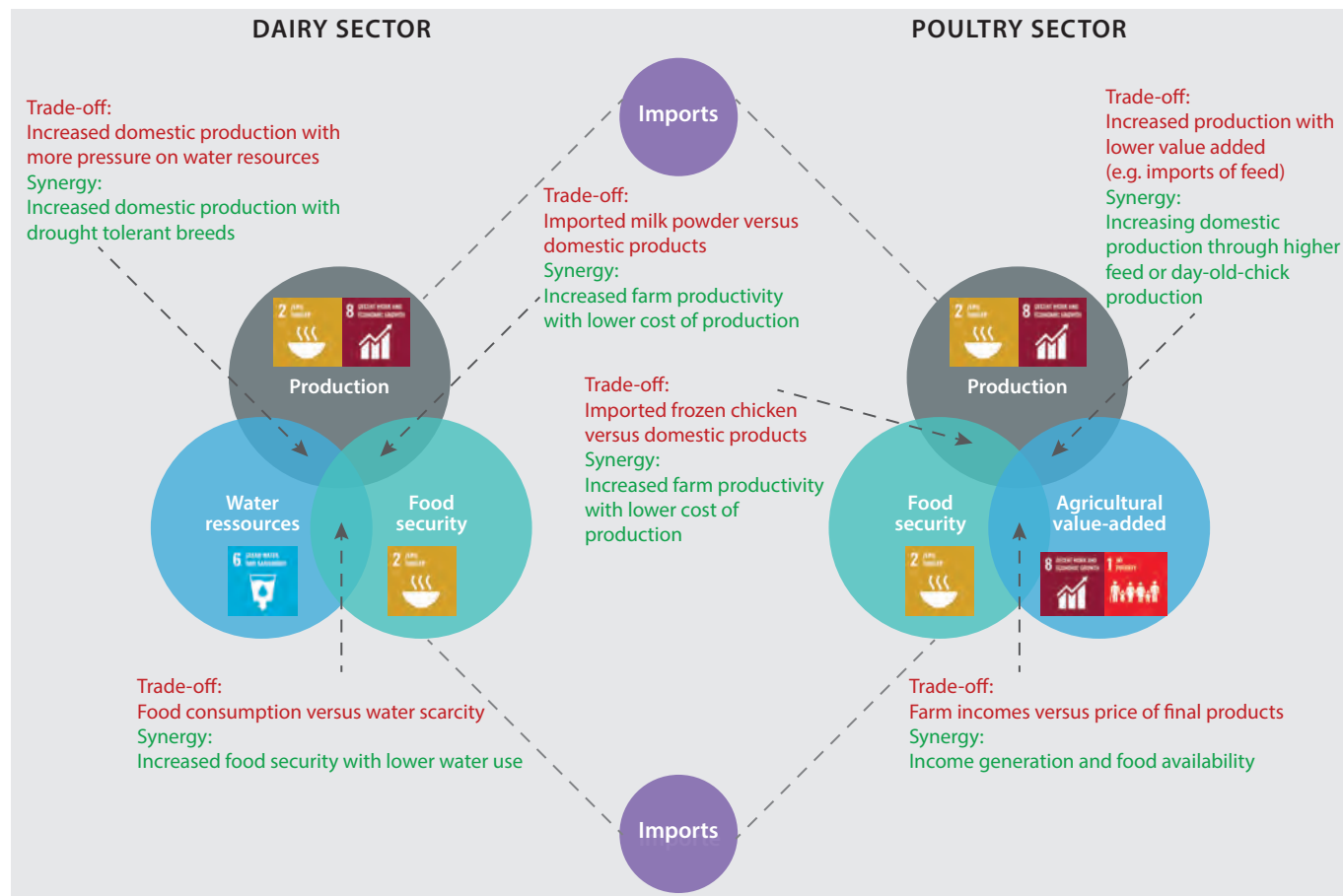


Dairy cattle in Ghana

Literature

Zamani O, Chibanda C, Boimah M, Asante-Addo C (forthcoming) Policy Effects and Coherence in the Agricultural Sector of Developing Countries: Evidence from Ghana

Figure 3.2: Synergies and tradeoffs between policy objectives in the dairy sector and the poultry sector



Source: Own presentation.



Cattle in Senegal

4 Poultry Sectors in Ghana and Senegal

4.1 Farm Performance and Economics of Broiler Production

- ◆ Broiler production in Ghana and Senegal is characterised by high production costs, with feed and day-old chick costs as the most significant cost items.
- ◆ Broiler production is profitable in Ghana as a seasonal activity and in Senegal as a year-round activity.
- ◆ Through the use of high-quality inputs (feeds and chicks) and proper husbandry practices, Senegalese broiler farms perform better and have lower production costs than Ghanaian farms.
- ◆ To compete against German and other international broiler farms, Ghanaian and Senegalese farms will have to improve performance and lower feed and day-old chick costs.

Craig Chibanda, Petra Thobe, Mohamad Isam Almadani, Claus Deblitz

Background and aims

Broiler producers in Ghana are struggling to meet the growing demand for chicken meat. Consequently, the country is dependent on frozen chicken imports. In Senegal, the importation of all forms of uncooked poultry meat was banned in 2005 by the government in an attempt to prevent an outbreak of Avian Influenza (AI). The ban is not only protecting the country from AI but also from competition against low-priced frozen chicken imports. Here, we present the results of Work Package (WP) 2 of the IMMPEX project. WP2 examines the economics and international competitiveness of typical broiler farms in Ghana and Senegal.

Data and methods

The typical farm approach was used for the farm economic analysis. The approach entails using semi-structured interviews, expert consultations and focus groups

to construct virtual farm data sets that are called 'typical' farms. Typical conventional broiler production data sets were constructed for Ghana, Senegal and Germany. Including the German farms enabled an international comparison. Three typical farms were constructed in each country and named according to their respective country codes and the total number of chickens they produce annually (in thousands).

Key findings

Farm performance

Typical broiler farms from Senegal are performing better than those from Ghana in terms of the Feed Conversion Ratio (FCR) and mortality rates (Table 4.1.1). Senegalese medium-scale farms (SN_38K and SN_36K) have performance indicators that are almost comparable to those of German farms, which are the most efficient farms in this comparison. The good performance

of the Senegalese farms is due to the use of high-quality feed, chicks, and proper husbandry. In contrast, Ghana's low farm performance is due to the use of poor-quality inputs (poor-quality feed and low-quality, locally-hatched day-old chicks) and poor husbandry practices. Broiler production in Ghana is seasonal due to competition from low-cost frozen chicken imports. This is because producers can only sell their chickens during festive seasons, when there is an increase in demand from local consumers.

Comparison of costs of production and profitability

The costs of feed and day-old chicks (DOCs) are the most significant cost items for typical broiler farms in Ghana, Senegal and Germany (Figure 4.1.1). Ghanaian farms have the highest production costs, followed by Senegalese farms and German farms. The Ghanaian farms have the highest production costs because they have higher costs of feed, DOCs, and veterinary services. GH_3K and GH_12K have higher DOC costs because they are rearing imported DOCs that are more expensive. The farms prefer to rear DOCs imported from Europe and the Ivory Coast because the domestically hatched DOCs are of a lower quality. In contrast, the Senegalese farms are

using locally hatched DOCs that are more affordable. The DOCs in Senegal usually come from imported hatching eggs or imported breeder stocks. German producers typically rear much more affordable DOCs that are hatched domestically. As for the feed costs, many factors can account for the differences across the three countries. At farm level, the main factor is feed use efficiency. The German and Senegalese farms are more efficient in feed use (low FCR). The farms use less feed to produce a kilogram of meat in comparison to the Ghanaian farms. This implies that they spend less on feed per kilogram of meat produced.

Figure 4.1.2 shows that despite the high costs of production in Ghana and Senegal, broiler production is profitable in Ghana as a seasonal activity and in Senegal as a year-round activity.

Conclusions

To improve the performance and lower production costs of broiler farms in Ghana and Senegal, we recommend the following interventions:

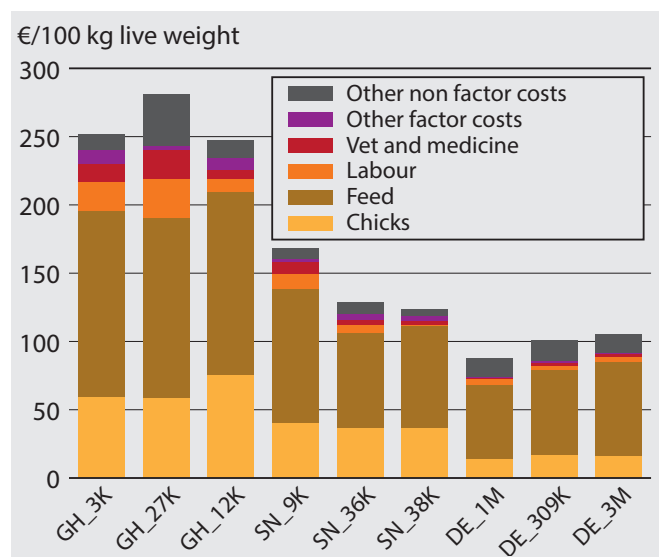
Table 4.1.1: Comparison of farm performance indicators

	Ghana			Senegal			Germany		
	GH_3K	GH_12K	GH_27K	SN_9K	SN_36K	SN_38K	DE_1M	DE_309K	DE_3M
Feed Conversion Ratio (FCR)	2.43	2.08	2.33	2.06	1.78	1.61	1.52	1.51	1.70
Mortality at farm level (%)	2.88	4.08	10.00	5.00	5.00	3.50	2.35	3.40	4.26
Number of cycles per year	3.72	3.00	3.00	6.00	6.20	6.10	7.80	7.60	7.30

Farm names: Country abbreviation_number of broilers sold annually, where K = 1,000 head, M = millions of head

Source: Own survey and calculations.

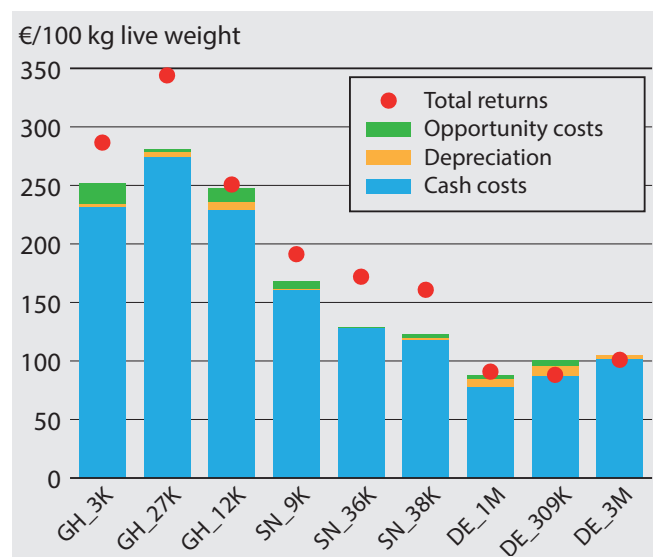
Figure 4.1.1: Comparison of production costs



Source: Own survey and calculations.

- ◆ Producers' husbandry practices can be improved in both countries through increased extension services and training.
- ◆ Using high quality inputs and proper husbandry practices can improve the feed-use efficiency of Ghanaian farms and reduce their feed costs. The quality of locally-hatched DOCs could be improved by monitoring and regulating hatchery operations.
- ◆ The costs of DOCs could be reduced in Senegal by promoting the importation of breeder stocks.

Figure 4.1.2: Total costs, returns and profitability



Source: Own survey and calculations.

Although Ghana's and Senegal's farms may improve their performance and production costs slightly, local chicken meat will likely be unable to compete with imported frozen pieces due to limited slaughtering facilities and dependence on imported inputs (chick genetics, feed ingredients). To resolve these issues, sector-wide interventions and substantial investments will be needed.



Recently placed chickens in Senegal

Literature

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- ◆ Ghana and Senegal are pursuing different poultry trade policies. Ghana permits the trade of poultry meat and Senegal banned the importation of uncooked poultry meat.
- ◆ In both countries, broiler value chains face high costs of production, especially feed costs, despite their differing policies.
- ◆ Domestic chicken trade is dominated by live fowl sales in Ghana and Senegal due to limited processing and cooling facilities.
- ◆ Incentives that encourage local and foreign investments in the processing, distribution and marketing of domestic chicken meat are key to the development of the broiler value chains.

Craig Chibanda, Mavis Boimah, Daniela Weible, Claus Deblitz

Background and aims

Ghana permits the trade of poultry products and is dependent on frozen chicken imports. In contrast, Senegal has banned the importation of uncooked poultry meat since 2006, officially to prevent an outbreak of the Avian Influenza virus. We present the results of Work Package (WP) 3 of the project IMMPEX. We present the organisation, infrastructure and logistics of broiler value chains in Ghana and Senegal.

Data and methods

The broiler value chains in Ghana and Senegal were studied using multi-stakeholder workshops, key informant interviews and the Delphi method. The multi-stakeholder workshops brought together 44 participants in Ghana and 45 participants in Senegal. The key informant interviews involved 25 actors in Ghana and 19 in Senegal. The Delphi method was used to identify and rank

the main challenges facing the Ghanaian broiler value chain. The study was composed of 21 poultry experts.

Key findings

Structure of the Ghanaian and Senegalese broiler value chains

The key actors in the Ghanaian and Senegalese broiler value chains include feed millers, hatcheries, producers, traders, slaughterhouses and distributors (retailers, cold stores, live bird markets).

The main inputs for broiler production are day-old chicks (DOCs) and feed. In Ghana, the producers use imported DOCs and locally hatched DOCs. Many producers prefer to rear imported DOCs because they are of a higher quality than the locally hatched ones. Most of the imported DOCs originate from Europe and the

Ivory Coast. In contrast, the Senegalese poultry industry largely rears locally hatched DOCs. The local hatcheries hatch the DOCs from either imported hatching eggs or from imported breeder stocks. In terms of feed, Ghana produces a significant amount of its key feed ingredients (maize and soy meal) while the Senegalese feed industry relies almost entirely on imports of key feed ingredients.

While poultry production in Senegal has witnessed significant growth after the ban, processing remains limited. An estimated 70% of the chickens are sold as live birds. The remaining 30% are sold as processed birds. The processing is often done by a few automated formal slaughterhouses and numerous informal manual processors. However, manual processing has a high probability of introducing bacteria into the meat. Similar to Senegal, sale of live chickens dominates the trade in Ghana and there is little value addition. In both countries, when processing does happen, it ends up as whole dressed chickens.

Comparing imported with domestic chicken meat in Ghana

In Ghana, imported frozen chicken pieces (thighs, wings, backs, feet, gizzard, etc.) dominate the market. Imported chicken meat varies from domestic chicken meat in various ways. First, imported chicken meat is always available with traders (importers, wholesalers and retailers) while live chicken trade is faced with frequent shortages. Second, imported chicken meat is more convenient to consumers, saving time spent on preparation. Third, imported chicken is retailed in smaller portions, offering consumers the opportunity to buy what they can afford compared to domestic chickens which are often sold live or in its whole processed state. Fourth,

imported chicken meat is cheaper compared to domestic chicken meat.

Challenges facing the broiler value chains

The Delphi study revealed that poultry experts in Ghana perceive low-cost frozen chicken imports and high feed costs as the most important challenges facing the broiler value chain. Other challenges that were identified include: limited access to credit, low biosecurity measures, high costs of equipment, poultry diseases, low-quality feed, high costs of DOCs, inadequately equipped slaughterhouses and poor quality of locally hatched DOCs. The Senegalese broiler value chain faces the same challenges as the Ghanaian value chain. However, the main differences are that chicken imports, quality of locally hatched DOCs and quality feed are not considered as key challenges in Senegal. Furthermore, both countries have limited processing and cooling facilities. As compensation for the lack of cooling facilities, chicken meat sold in open markets is sometimes treated with formalin, which poses health risks to consumers.

Conclusions

Based on our study, the following are some broad policy interventions that policymakers in Ghana and Senegal may consider:

- ◆ Incentives that encourage local and foreign investments in the processing, distribution and marketing of domestic chicken meat are key to the development of the broiler value chains. Such incentives could include financial incentives (e.g. grants, loans), technical support incentives (e.g. extension services) and fiscal incentives.



Dressed chickens being sold in an open market in Dakar, Senegal

- ◆ Capacity development through training and increased extension services are important for improving hatchery practices and poultry husbandry.

Literature

Boimah M, Chibanda C, Schott J, Awuni S (2022) Doing it right to alleviate poverty: application of the sustainable food value chain development framework to Ghana's poultry sector, *International Journal of Agricultural Sustainability*, DOI: 10.1080/14735903.2022.2152605

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Chibanda C, Wieck C, Sall M (2023) An analysis of the broiler value chain and economics of broiler production in Senegal: status quo after two decades of import restrictions. *Journal of Agribusiness in Developing and Emerging Economies*. DOI:10.1108/JADEE-08-2022-0189



Poultry in Ghana

4 Poultry Sectors in Ghana and Senegal

4.3 Consumers' Preferences in Ghana

- ◆ Consumers in Ghana prefer domestic to imported chicken and are willing to pay a premium for domestic chicken.
- ◆ Imported chicken can be regarded as a (weak) substitute rather than a complement for domestic chicken.
- ◆ Income is a significant driver of domestic chicken consumption in Ghana.
- ◆ Consumers in Ghana prefer antibiotic-free, highly convenient (chicken cuts), and fresh (chilled) chicken.
- ◆ Policymakers need to invest in food safety standards to address consumers' safety concerns.

Collins Asante-Addo, Daniela Weible, Janine Pelikan

Background and aims

Demand for food in sub-Saharan Africa (SSA) is rapidly transforming toward high-value products such as meat. Among the meat products, poultry accounts for the bulk of consumption in the region because it is widely available and relatively cheap. The current nutrition transition has led to increasing imports of poultry products because domestic production has been inadequate to match the growth in demand. This development has put additional pressure on domestic producers leading to criticisms of imports and a call for action to salvage the poultry industry. This dilemma has been particularly evident in Ghana.

The survival of the domestic poultry industry could be ensured in at least two ways. One way is using protectionist and restrictive measures, such as the imposition of higher import tariffs. Another option is to address existing gaps in the demand profiles of consumers by

identifying important product attributes and related factors that drive their choices and consumption decisions.

The dissertation on which this chapter is based, "Preferences for poultry meat in Africa: Analysing consumer demand for Ghana" focuses on the latter and identifies factors that influence consumers' demand for chicken meat and estimate the willingness to pay for important chicken meat attributes.

Data and methods

The project uses a mixed methods design involving the combination of qualitative (focus groups) and quantitative research (face-to-face interviews) methods.

The focus group discussions involved 44 participants drawn from Accra. Transcripts from the focus groups were analysed using content analysis. The quantitative survey

included a discrete choice experiment (DCE) and involved 500 respondents selected from Accra and Kumasi. The survey data were analysed using statistical techniques such as exploratory factor analysis, ordered probit, random parameter logit, and latent class logit models.

Key findings

Focus group discussions revealed that origin, price, taste, freshness, ease of preparation (convenience), safety and health, availability, tenderness, and meat colour are the main factors consumers consider when selecting chicken meat.

Regarding imported and domestic chicken, consumers hold positive perceptions about the quality of domestic chicken on aspects such as freshness, taste, and healthiness compared to imported chicken. In contrast, the



Imported chicken meat on a local market in Accra, Ghana

focus group participants evaluated the price, convenience, and availability of domestic chicken less favourably than imported chicken.

According to the results of the quantitative survey (face-to-face interviews), approximately 45 % of respondents claim to consume chicken meat at least weekly or more. However, domestic chicken meat is consumed less frequently compared to imported chicken. A regression analysis shows that these two products are more often consumed exclusively than in conjunction, and can be regarded as (weak) substitutes.

The findings further reveal that consumer attitudes and perceptions about food safety, price, and convenience reduce regular consumption of domestic chicken, while perceived quality and ethnocentrism as well as higher income increase regular consumption. On the other hand, frequent consumption of imported chicken is driven by attitudes toward price, availability and convenience.

However, since preferences are heterogeneous among consumers, we identified four main consumer segments based on the preferences for these attributes, namely domestic chicken advocates, foreign chicken lovers, claim (safety) conscious, and random choosers. The domestic chicken advocates are willing to pay premiums more than twice the average that the entire sample of consumers is willing to pay, suggesting a potential and hope for domestic chicken.

Conclusions

In order to improve the competitiveness of the domestic poultry industry and ensure its survival, policymakers in Ghana could address several aspects.

- ◆ Policies should aim at creating an enabling environment to attract private sector investments in infrastructure for processing (slaughtering and cutting), storage (cold chains), and marketing.
- ◆ There is a need for prudent investment to boost production output that will match the capacity of the processing industry.
- ◆ Consumer concerns about food safety require government intervention. Investment is needed in food safety standards (voluntary or mandatory) to manage safety issues in the supply chain (e.g., antibiotic-free or hormone-free claim).
- ◆ Finally, effective enforcement of existing quality control systems and a successful communication strategy that increases consumer knowledge are needed to change their safety risk perceptions and to induce positive attitudes. This might then lead to better informed choices, and ultimately, generate effective market demand.



Domestic chicken meat on a local market in Accra, Ghana

Literature

Asante-Addo C, Weible D (2019) "Everybody likes chicken" – A focus group study of consumers in Ghana. Selected paper presented at the 59th Annual Conference of the German Association of Agricultural Economists (GEWISOLA), Braunschweig, Germany.

Asante-Addo C, Weible D (2020) Imported versus domestic chicken consumption in Ghana: Do attitudes and perceptions matter? *Journal of International Food & Agribusiness Marketing*. DOI:10.1080/08974438.2020.1751767

Asante-Addo C, Weible D (2020) Is there hope for domestically produced poultry meat? A choice experiment of consumers in Ghana. *Agribusiness*, 36(2), 281–298.



Focus group discussions in Ghana



4 Poultry Sectors in Ghana and Senegal

4.4 Consumers' Preferences under an Import Ban Policy in Senegal

- ◆ Domestic chicken is perceived as fresher, tastier and healthier.
- ◆ Senegalese who preferred domestic chicken meat even before the ban, would be willing to accept imported chicken at a significantly lower price.
- ◆ 57 % of consumers are highly ethnocentric and strongly object to a reversal of the import ban.
- ◆ The government should ensure low consumer prices, e.g. by exploring local feed ingredients to improve costs in primary production.

Mavis Boimah, Daniela Weible

Background and aims

In an attempt to prevent the entry and spread of the Avian Influenza virus, the government of Senegal banned poultry meat imports in all forms in the year 2006. Prior to the ban, imports constituted 34% of domestic consumption between 2003 and 2005. Currently, with the exception of value-added products such as nuggets and sausages, all other types of chicken meat consumed are domestically produced. Nevertheless, due to the low level of international competition, in theory consumers would be offered low quality chicken products, a limited product range or pay higher prices than they used to. Empirical studies on the impact of the poultry import ban on consumers' demand, interests and expectations are barely exist.

To shed some light on the extent to which consumer interests align with protectionist policies, we (1) assess consumers' perceptions with reference to the import ban, (2) identify consumers' preferred chicken attributes,

and (3) analyse the impact of the import ban on consumer welfare. This study is part of the fourth work package of the project IMMPEX.

Data and methods

The study relies on focus group discussions (FGDs) and household surveys. The focus groups were held with consumers between February and March 2020. A total of 38 participants were recruited from homes and neighbourhoods in Dakar and Thiès, two major cities in Senegal. The household level data was collected between January and February 2022. A multistage sampling procedure was used in gathering the data from three cities: Dakar, Thiès, and Kolda due to the high pattern of chicken meat consumption. The survey involved 300 households. The questionnaire included a Discrete Choice Experiment (DCE) and a reviewed Consumer Ethnocentric Tendencies Scale (CETSCALE).



Chicken meat displayed for sale in an open market in Dakar, Senegal

The data were analysed using qualitative content analysis, exploratory factor analysis, probit and random parameter logit models.

Key findings

The focus group discussions revealed that chicken meat is eaten on average once a week or more often in Senegal. Participants expressed a positive attitude towards domestic chicken meat even before the import ban because they perceive it as fresher, tastier, healthier, of higher quality, and are assured of the conditions under which the fowls are raised domestically.

Some participants perceived domestic chicken as safer due to the known conditions. However, other participants confirmed that safety issues exist, especially with storage and marketing of processed domestic chicken in Senegal. This is especially evident in traditional markets where raw chicken meat is displayed for sale on

bare tables without any form of packaging or chilling. The raw meat has a high potential of attracting bacteria and other food-borne pathogens. Also, decomposition could set in leading to a reduction in quality considering the high tropical temperatures of above 25 °C.

Participants stated that chicken meat imported into the country before the ban was mostly in frozen cut portions, packaged in cartons and had labels providing information such as the origin of the product and expiry dates. In contrast, domestic chicken is sold mostly live or in a whole dressed form (fresh or frozen). Chilled domestic chicken cuts are available in supermarkets and cold stores; however, this is a marginal sales channel. According to results of the quantitative survey, whole dressed chicken meat is preferred to cuts. In contrast, with the more liberalised policy on poultry trade in Ghana, for example, imported chicken cuts dominate the market and Ghanaian consumers prefer to have domestic chicken cuts instead of whole dressed chickens. From these two contrasting findings on preferred “product form”, consumption habits seem to persist and affect consumers in their preferences and attitudes. However, the analysis also exhibits some heterogeneity in consumer preference for product form – this means there is a section of Senegalese who would prefer chicken cuts to whole dressed ones.

From the consumers’ perspective in the FGDs, the import ban has contributed to the development of the domestic production sector by providing jobs for many including the youth, resulting in an increased supply and patronage. Yet, a few of the participants mentioned that the ban is impacting negatively on low-income households who no longer have the opportunity to buy chicken in smaller quantities. Based on the data of the household survey, we were explicitly able to identify two groups of respondents: one segment constituting



Chilled chicken parts in a supermarket

57% of the sample who exhibit a high level of ethnocentrism (i.e., perceive domestic chicken as superior to imported ones), and the other (43%) with a low level of ethnocentrism. Males, younger Senegalese, the married, and those with high-incomes are significantly more likely to belong to the highly ethnocentric segment, whereas larger household sizes and higher educational attainments lead to a strong and significant chance of belonging to the low ethnocentric segment. Consumers who are highly educated seem to be more open and liberal. Moreover, highly ethnocentric consumers associate chicken meat stored in deep freezers for longer periods with a loss of taste and strongly object to a reversal of the import ban.

Furthermore, the choice experiment reveals that Senegalese are willing to pay a premium for domestic chicken meat instead of imported frozen cuts. Imported chicken will be accepted only if the price is significantly lower than that of domestic chicken. This means in case the ban on imports is lifted, the majority of Senegalese may continue to choose domestic chicken over imported versions as long as the price difference is small. However, the study already finds a significant price difference between domestic and imported chicken meat.

The Government can assume that those consumers who currently strongly prefer domestic chicken would continue to consume it even if the ban were lifted. However, in that case more households, particularly poorer ones, could have better access to chicken meat. Also, for those households currently consuming domestic chicken, substitution effects cannot be completely ruled out. There might be consumer segments who could substitute or complement domestic with imported chicken meat. In particular, this is likely for those consumers and households who exhibit (i) a low level of ethnocentrism regarding chicken meat (and are safety conscious), (ii) those who prefer chicken cuts, and (iii) those who have lower incomes, higher education and larger household sizes.

Conclusions

Most Senegalese have a positive perception towards domestic chicken meat and have exhibited a preference for it.

- ◆ Policies and investments could aim at improving processing and packaging. This will enhance the hygienic conditions and safety in the value chain, ensuring the protection of consumers from food-borne illnesses.
- ◆ Public awareness campaigns should be organised for example by the government and the consumer protection association to educate consumers on the indicators of contaminated meat and the health risks associated with consuming chicken left unrefrigerated for several hours.
- ◆ The Government should ensure low consumer prices. This could be achieved, for example, by reducing production costs through local alternative feeds.



Imported frozen poultry meat in Ghana



Live chicken on a market in Senegal

Literature

Boimah M, Weible D (2021) Assessing protectionism and its impact from consumers ' perspective : The case of Senegal ' s poultry import ban. World Food Policy, (March), 1–15. <https://doi.org/10.1002/wfp2.12025>

- ◆ Cattle are primarily kept for beef production, while dairying is still a developing industry in Ghana and Senegal.
- ◆ Agro-pastoral and pastoral systems are characterised by local breeds with low milk-yielding capacities.
- ◆ Ghana has lower costs of raw milk production compared to Senegal.
- ◆ Feed costs and family labour are crucial factors in the profitability and competitiveness of dairy production systems.

Anoma Gunarathne, Mohamad Isam Almadani, Lena Behrendt, Craig Chibanda, Claus Deblitz

Background and aims

Rapid population growth, rising per capita income, and urbanisation have led to large increases in the milk demand in West Africa, and this trend will inevitably continue. Between 1996 and 2018, per capita consumption of milk has increased from 3.9 kg to 9.9 kg milk equivalent in Ghana and 25.9 kg to 47.7 kg milk equivalent in Senegal. Nevertheless, domestic milk production has been insufficient in meeting the increasing demand, and presently both countries rely heavily on imports of milk products, mainly from the European Union. Thus, boosting domestic raw milk production is needed if the reduction of imported milk powder is an objective.

This chapter presents the results of the second work package of the project IMMPEX. The main purpose of this work package is to identify and characterise the prevailing dairy production systems and measure and compare the cost of milk production of different milk production systems in Ghana and Senegal.

Data and methods

For our study, we constructed six typical dairy farms representing the most common dairy production systems in each country. The typical farms were constructed through a series of steps referred to as the *agri benchmark* Standard Operating Procedure (SOP). **Step 1**, by reviewing national statistics and consulting local experts, the researchers identified the most important production regions and within them most common dairy production systems. **Step 2**, in consultation with local experts, the researchers selected individual farms with characteristics that represent the identified typical production systems. The selected farms were visited, and interviews were conducted with producers to point out the physical and cost parameters of the selected farms. **Step 3**, focus groups were then conducted to determine the farm data's plausibility and gain an in-depth understanding of the production systems. **Step 4**, the collected typical farm data was analysed using the Technology Impact Policy Impact Calculations (TIPI-CAL) model.

Key findings

The key characteristics of the typical farms are summarised in Table 5.1.1. The typical farms were named according to their country code and the number of their milking cows. The differences between all the farming systems are primarily driven by the disparities in inputs and outputs.

Figure 5.1.1 compares costs of milk production and reveals that milk production in Ghana is relatively cost-competitive compared to Senegal. Feed and labour costs are the highest variable costs on all dairy farms in Ghana and Senegal.

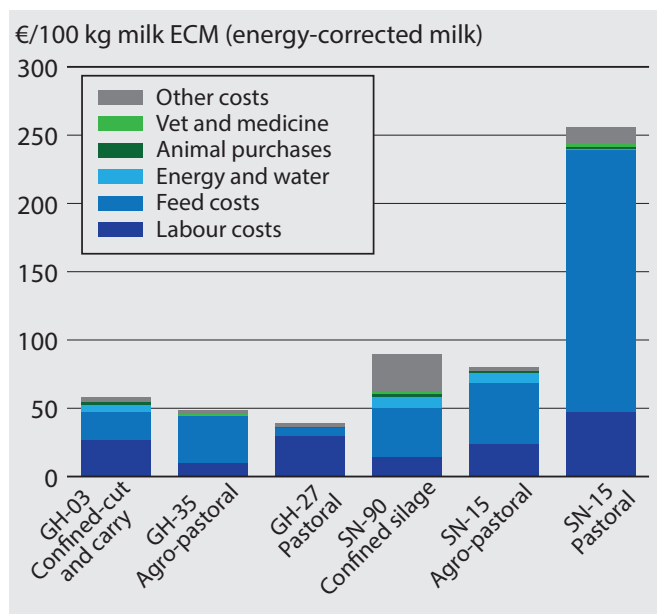
In Ghana, feed costs account for up to 36% of the total costs for GH_03 and 72% for GH_35, and 15% for GH_27. GH_03 relies entirely on purchased feed supplements during the dry season, and also purchases grass and plantain leaves during the wet season. However, GH_35 usually provides purchased feeds only during the dry season (November to March) to help maintain milk production. GH_35 has higher feed costs in comparison to GH_03 because it provides feed to bulls as the farm keeps its bulls on the farm for an extended period. In contrast, GH_03 sells its calves after weaning. The farm GH_27 has the lowest feed costs (year-round grazing) but the highest labour costs. The Fulani cattle keepers accompany the animals permanently, receive a basic

Table 5.1.1: Characteristics of the typical dairy production systems

Farm		GH_03 Confined cut and carry	GH_35 Agro-pastoral	GH_27 Pastoral	SN_90 Confined silage	SN_15 Agro-pastoral	SN_15 Pastoral
Breeds		Jersey Local x Sanga Friesian	Jersey x Local Nigeria x Local	Sanga WASH x White Fulani	Holstein, Normande	Gobra, Ndama, Diakore	Gobra, Gouzerat
Milking cows		3	35	27	90	15	15
Farm land ha		0.2	0.4	1.6	73	1	8
Milking yield kg/cow/year		4,160	1,063	963	3,150	600	179
Labour hrs/year		1,008	4,592	2,080	37,440	6,760	4,704
Cattle sold		Calves	Finished cattle	Finished cattle	Calves	Finished cattle	Finished cattle
Feed ration		Cut grass, Wheat bran, Brewers grain	Grazing, Wheat bran, Cassava peels	Grazing, Cow-pea, Cassava peels	Sorghum, Maize silage, Maize grain, Panicum, Rice bran	Grazing, Crop residues, Cottonseed, Peanut hay	Grazing, Peanut oil, Maize

Source: Own survey and calculations.

Abbildung 5.1.1: Comparison of milk production costs



Source: Own survey and calculations.

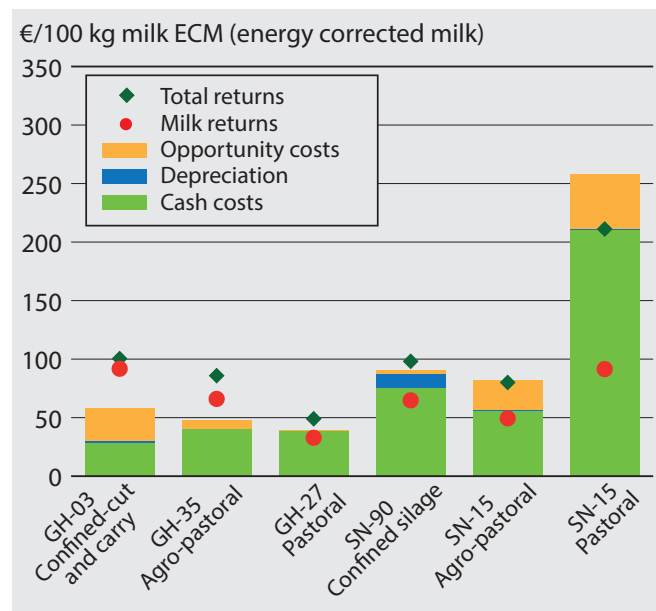
wage and keep the milk produced on the farm, which we have valued at the milk price.

In Senegal, feed costs account for up to 40 % of the total costs for SN_90 and 54 % for SN_15 (agro-pastoral), and 75 % for SN_15 (pastoral). Low productivity indicators for SN_15 (pastoral) represented by a low calving rate and high mortality have led to high production costs per unit production. Moreover, SN_15 (pastoral) had the highest feed cost due to the long dry season (November to June), which depends highly on purchased feed with limited grazing. Similar to GH_03, SN_90 provides more concentrates to its cows: the concentrates are both purchased and home-grown, and the high feed cost is mainly due to Holstein cows with high feed requirements. SN_90

has high depreciation costs due to large investments in buildings and machinery for Holstein cows. The high labour cost in SN_15 (agro-pastoral) and SN_15 (pastoral) is mainly attributed to the high opportunity cost of family labour. The availability of grazing land in Ghana and cheaper agro-industrial by-products also contribute to lowering the costs of milk production compared to Senegal.

Figure 5.1.2 shows that GH_03 makes a high return of 91% of total returns from milk, followed by GH_35 (76 %) and GH_27 (65.9). The differences in the results can be attributed to the better genetic potential of milking cows, better animal husbandry practices, and access to a better milk price that enabled GH-03 farmers to get higher milk

Abbildung 5.1.2: Comparison of milk production profitability



Source: Own survey and calculations.

returns. However, due to low productivity and low milk prices, milk returns in GH_27 are not able to cover cash costs. Except for GH_03, all farms in Ghana and Senegal earned considerable returns from heifers and cull cows.

Despite low milk yield, SN_15 (pastoral) farms enjoy higher milk prices as the availability of milk on the market is scarce. The study confirmed that all the farms besides SN_15 (agro-pastoral) and SN_15 (pastoral) were profitable in the short, medium, and long terms. SN_15 (pastoral) had the lowest milk yield and highest feed costs. Therefore, SN_15 (agro-pastoral) and SN_15 (pastoral) are economically unviable in the long term because total returns cannot cover the total costs.

Conclusions

Based on the results of this study, it is suggested that both countries face similar challenges. Therefore, the following actions would assist the increase of domestic milk production and potentially its market share.

- ◆ Improve access to quality breeding services, both in terms of artificial insemination and appropriate breeding bulls, to significantly increase milk production. Also, it is important to improve the indigenous cattle breeds through genetically selecting the best sires available domestically.
- ◆ Increase the access and utilisation of locally available, relatively cheap crop residues and agro-industrial by-products (e.g., groundnut, cowpea).
- ◆ Bridging the knowledge and skill gaps in dairy husbandry through developing and implementing training modules on, e.g., fodder production and conservation, feed storage, feed formulation, and

feeding dairy cows. Moreover, actively encourage farmers to participate in training and continue to advance their knowledge and skills.

- ◆ Increase dairy market outlets by forming market-oriented dairy producer led-cooperative and increasing and improving infrastructure facilities in order to reduce transaction costs associated with distance from milk market outlets (roads, cooling and milk processing facilities).



Dairy cows in Ghana

Literature

Gunarathne A, Almadani M I, Behrendt L, Chibanda C, Deblitz C (2022) Economic analysis of different dairy production systems in Ghana and Senegal: an application of typical farm approach. 185th EAAE seminar of the European Association of Agricultural Economists – EAAE 2022. DOI: 10.22004/ag.econ.329290.

- ◆ Local milk yields are very low in Ghana and Senegal and are not sufficient to meet the needs of the processing industry.
- ◆ In both countries a separate value chain exists for imported milk powder and local milk value, and a third value chain that combines milk powder with local milk is found in Senegal.
- ◆ In the fresh milk value chain, milk is handled under poor hygienic conditions and processing is highly artisanal, products from local milk are generally of poor quality and are usually uncertified.
- ◆ The value chain relying on imported milk powder is more developed and its products are often certified.
- ◆ Training programs must be instituted to empower farmers in the processing of milk to overcome fresh milk losses during the rainy season.

Mavis Boimah, Anoma Gunarathne, Daniela Weible, Claus Deblitz

Background and aims

Consumer demand for dairy products is increasing in Africa, especially in the West African region, where more than half of the dairy products consumed are directly imported or are domestically processed from imported milk powder. However, the EU exporting companies are continually criticised for flooding West African nations with cheap dairy exports. The allegations link the underdevelopment of the domestic dairy sectors to the activities of these EU dairies, and are mentioned as having negative consequences for producers. This chapter summarises the results of work package 3 of the IMMPEX project. Our aim in this study is to assess the local and imported dairy value chains in West Africa with a focus on Ghana and Senegal. Specifically, we identify the

actors and the structure of the value chains, the products, the differences in the use of local fresh milk and milk powder, and the barriers and challenges confronting the dairy sectors.

Data and methods

The data were gathered from both primary and secondary sources between February 2020 and May 2021 in both countries. Secondary data was based on desk reviews of relevant literature (e.g., reports, articles, etc.). For the primary data, a snowball sampling procedure was employed to identify key actors in both the fresh milk and milk powder value chains in Ghana and Senegal. A total of 59 key actors at different levels of the

value chain were selected and interviewed either face-to-face or via telephone.

Key findings

Two different value chains – local milk and imported milk powder exist in both countries. In Senegal, a third value chain that combines milk powder with local milk is found. The main actors in the local milk value chain in both countries are input suppliers, farmers, milk collectors, processors, wholesalers, retailers, and consumers.



Milk collection in Accra, Ghana

In the milk powder value chain, the main actors identified are importers, re-packagers, re-constitutors, processors, distributors, wholesalers, retailers and consumers. Significant differences exist between the local milk and milk powder value chains; (i) the local milk value chain is informal, traditional, and is not well organised,

(ii) milk handling and processing practices are purely traditional and artisanal, (iii) products from local milk are not diverse and are limited to yoghurt, pasteurised milk, cottage cheese which are also scarce to find, (iv) certification of products in the local milk value chain is low, and (v) packaging of local dairy products is poor while labelling is almost none existent.

The study finds that part of the processing industry which relies on imported milk powder performs well. Products are processed from either full-cream, skimmed or fat-filled milk powder. While some NGOs and researchers criticise the poor labelling of the vegetable fat blended milk powder, our study shows that processors are satisfied with its use. To a large extent, this industry is formal and modernised and its products are diverse and largely certified. Processed products in the milk powder value chain are well packaged and have labels with adequate information on traceability. Moreover, milk powder has many advantages over local milk as a raw material for processing. It is cheaper and always available in desired quantities, making it more accessible compared to local milk. Also, milk powder has a longer shelf-life, meaning it can be stored for more than one year. Besides, processed products from milk powder have longer shelf lives (usually more than 30 days) compared to fresh milk-based products, which are stored for 4 to 14 days.

In both countries, the local milk value chain is plagued with several challenges. Milk yields are very low and the supplies are highly unstable due to constraints related to (i) low genetic potential of local breeds used for milk production, (ii) the extensive grazing system (pastoral) of herds, especially during the dry season with nomadic-type of movements that do not facilitate the collection of milk, (iii) low level of development of agro-pastoral and pastoral dairy farming systems, (iv) seasonal variations in milk supply, and (v) water



Yoghurt made from milk powder

scarcity. Milk yields are much higher in the rainy season compared to the dry season, however, due to a lack of storage facilities and the long distance to market centres, farmers discard significant quantities of milk. Besides, it is costly for middlemen and processors to travel to milk producing areas which are located far from urban and city centres. Moreover, during the rainy season, the predominantly untarred roads get flooded, making it even more difficult for collectors to reach milk producers.

Collected fresh milk is stored in plastic gallons and buckets and these are transported without any form of cooling facilities. Furthermore, the tropical temperatures of above 25 °C accelerates a reduction in milk quality before it gets to the market or to the processors. In addition, the majority of the local value chain actors interviewed do not have any form of training on milk handling, processing and marketing. Attaining self-sufficiency in milk

production is impossible for both nations considering the challenges of the local milk sectors. The Artificial Insemination program in Senegal is impacting positively on milk yields. Therefore, few processors combine fresh milk with milk powder for their products. However, milk powder still constitutes a significant proportion of processed dairy products in Senegal. This shows that in the absence of imported milk powder, the dairy processing industry in both countries is likely not sustainable.

Conclusions

The local milk value chains in Ghana and Senegal face numerous challenges which hinder them from meeting the demands. As our study shows, restricting imports will not be a solution to the underdeveloped local dairy sectors. However, the following actions could assist in increasing local milk production and supply.

- ◆ Intensive practical training on forage production and storage, milk handling, safety and hygiene are necessary.
- ◆ The governments should apply national standards and quality policy to the local milk sector. A registration of local value chain actors in a database might help to know the companies and to ensure compliance with standards.
- ◆ One way of overcoming fresh milk losses during the rainy season is to process it into final products such as artisanal cheese or ultra-high heat milk, which have longer shelf lives compared to the pasteurised milk and cottage cheese. Training programs and dairy processing equipment must be provided to empower farmers in the processing of milk.

- ◆ Collection centres should be built close to milk production areas. Also, existing producer associations should be strengthened and the formation of new ones encouraged to facilitate the collection of fresh milk. Facilitating milk collection systems in rural areas will aid rural producers in reaching urban markets and improve their incomes.

Literature

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Powdered milk products in a supermarket



Tasting of fresh processed yoghurt

- ◆ Consumers prefer local dairy products to imported dairy products and to dairy products that are domestically processed from imported milk powder in Ghana and Senegal.
- ◆ Availability of local dairy products is very low resulting in a regular consumption of imported and domestically processed products.
- ◆ Local dairy products are seen as expensive, their safety is mostly not assured, diversity in products is low, and their processing largely remains artisanal.
- ◆ Imports ensure a reliable access to affordable dairy products for consumers in Ghana and Senegal.
- ◆ Food safety standards should be enforced by the appropriate authorities to address consumers' safety concerns.

Mavis Boimah, Daniela Weible

Background and aims

The end of the European Union's milk production quotas in 2015 coupled with other factors in the global milk market such as favourable prices has resulted in an expansion of European dairy companies' operations in developing nations, particularly in West Africa. The fast-growing dairy industry in this region makes it one of the most important contributors to employment and income. Various dairy products are imported by West African countries. Besides, the processing industry that relies on milk powder has seen a significant growth over the last two decades, and an increase is expected in consumer preferences for more diversified dairy products implying further growth of the sector.

In this report, we summarise the research on dairy products in Ghana and Senegal as part of the fourth work

package of IMMPEX. The focus is on consumer perceptions and preferences, as well as consumption habits with respect to dairy products in urban regions in Ghana and Senegal. We differentiate between three types of dairy products; (i) products made from fresh local milk 'local products', (ii) domestically processed products from imported milk powder, and (iii) imported products.

Data and methods

The study dwelt on both focus group discussions and household surveys. The focus groups were held with 36 participants in Dakar and Thiès (Senegal) between February and March 2020. The household surveys occurred in March 2021 in Ghana in three cities – Accra, Kumasi, and Tamale and from January to February 2022

in Senegal also in three cities – Dakar, Thiès, and Kolda. A multi-stage sampling procedure was applied in the survey. A total of 312 and 532 households were interviewed in Ghana and Senegal respectively. The data were analysed using mixed methods including qualitative content analysis, exploratory factor analysis, and an ordered and binary logit models.

Key findings

The focus group discussions revealed that Senegalese consumers perceive local dairy products as more natural, healthier and tastier compared to imported and domestically processed products. The latter are

perceived as not fresh and unnatural, i.e., adulterated with fat from vegetable sources. In contrast, participants evaluated the price, availability, diversity and safety of local products as less favourable. Imported milk products on the other hand are available in a wide variety of forms (powdered, sweetened or unsweetened, concentrate, skimmed, whole or liquid) as yoghurts, ice cream, evaporated milk, milk powder, UHT, cheese, or butter. It also emerged from the quantitative survey that Ghanaian respondents prefer local milk and its products because they perceive them as having a high nutritional value and as being tastier, healthier, more natural, and fresher. Dairy products are generally consumed on a regular basis in both countries. In Senegal, milk and its products are a component of traditional dishes. According to results of the quantitative survey, 98 % and 76 % of households stated to consume dairy products at least 2 to 3 times a week in Senegal and in Ghana respectively. Here, dairy products are often consumed with breakfast cereals and beverages and thus included in meals.

To understand consumer behaviour with regards to product origin, we focused on yoghurt for a further in-depth analysis. In both countries, yoghurt is the sole product available as local, domestic and imported. We found a significant proportion of respondents in Ghana (43 %) who have never consumed local yoghurts compared to 14 % in Senegal. Most Senegalese (43 %) consume local yoghurt occasionally. Thus, the most frequently consumed types of yoghurt are those domestically processed from imported milk powder and those which are imported. The findings show that consumption frequencies are largely driven by availability. Local yoghurts are scarce to find which is encouraging the consumption of domestic and imported yoghurt in both countries. There has never been a shortage of both imported and domestically processed dairy products on the market.



A household interview in session – Thiès, Senegal



Processing of a local dairy product (Wagashi) in Ghana

Generally, higher income increases the regular consumption of all types of yoghurt in both countries, as well as higher education in the case of Ghana. In addition, consumers who perceive local dairy products as unhygienically produced and unsafe have a lower tendency to consume local yoghurts in Ghana. However, we observe that hygiene and safety concerns do not play a role in Senegal as in Ghana which shows that Senegalese consumers may have limited knowledge about foodborne illnesses.

Furthermore, low product diversity and low value addition to local milk decreases regular consumption of local yoghurt in both countries but increases regular consumption of domestic and imported yoghurt. Low value addition includes poor and unattractive packaging, missing certification and labelling. The processing of

local dairy products remains to a large extent traditional and is technically not modernised. The product range is limited to few products, such as fresh milk, yoghurt, wagashi (cottage cheese), and curdled milk.

Ethnocentric attitudes were displayed and expected to influence the choice of local over domestic and imported products. However, a significant positive influence of ethnocentrism is seen on the consumption of domestic and imported dairy products, revealing an “attitude-behaviour gap” in the purchase of dairy products in both countries. Consumers may demonstrate their preference for a specific product, however, final purchase decisions to a large extent can depend on factors such as “availability” and “affordability”. Actors in the value chain can see this as an opportunity to fill certain niches of local specialties that attract (a group of) consumers and for which those consumers are willing to pay.

From a broader lens, imported dairy products, especially milk powder, contributes to ensuring food security in Ghana and Senegal. In the case of Senegal where most traditional dishes are milk based, milk powder and its products are a supplement to scarce local milk.

Conclusions

In both countries, consumers have positive perceptions and preference for local milk and its products but primarily consume imported and domestically processed as well as imported products mainly because of low availability and higher prices.

- ◆ Imports are therefore encouraged so that consumers have access to affordable dairy products, at least for traditional, cultural and food security reasons.

- ◆ Food safety concerns require the intervention of governments. Policies should aim at creating a quality control system in the local milk value chain and food safety standards should be enforced by the appropriate authority.
- ◆ Awareness campaigns should be organised by e.g., the government and consumer protection associations to educate and inform consumers on the indicators of contaminated food and the health risks associated with consuming them.



Powdered milk products in a supermarket

Literature

Boimah M, Weible, D (2021) "We Prefer Local but Consume Imported": Results from a Qualitative Study of Dairy Consumers in Senegal, Journal of International Food & Agribusiness Marketing, DOI: 10.1080/08974438.2021.1986453

- ◆ Production increased after the implementation of the import ban on poultry products in Senegal.
- ◆ An increase in border protection in Ghana could more than triple domestic production but might reduce meat availability for consumers.
- ◆ An import ban for selected countries has nearly no effect on Ghanaian producers because imports come from other countries.
- ◆ Reducing feed costs is a key factor to increase the competitiveness of the poultry sector in Ghana.

Omid Zamani, Craig Chibanda, Janine Pelikan

Background and aims

This chapter summarises the fifth work package of the project IMMPEX. It represents a summary of the impact analysis of poultry policies in Senegal and Ghana. This report summarises the potential effects of the main policy options in the poultry sectors of Senegal and Ghana. More specifically, we aim to empirically analyse: First the trade restriction policies in the form of a partial or complete import ban. Second, expanding the tariff wedge between feed as an intermediate product for poultry productions and poultry meat as the final product, and third, the key drivers of broiler feed costs.

Data and methods

Given the scope of our analysis and data availabilities, we use various empirical methods at different scales; farm, meso, and macro levels. Our analysis framework constitutes of a spatial partial equilibrium model to assess the effects of feed costs on the poultry meat market in Ghana, the

Modular Applied General Equilibrium Tool (MAGNET) model to evaluate feed subsidies and trade restriction policies, and a data-driven synthetic control method (SCM). Additionally, we use a farm-level analysis to capture the potential effects of each scenario on broiler farm performance.

Key findings in Senegal

A complete import ban in 2006 is the main policy intervention in the Senegalese poultry sector. Our analysis carried out using the Synthetic Control Method reveals that Senegal's production of chicken meat grew more than it would have in the absence of the import ban (the gap between Senegal and synthetic Senegal). In line with the infant theory argument, this suggests that the ban has had a favourable effect on chicken production. Additionally, a comparison of the performance and costs of production of typical farms in Senegal and Ghana shows that the Senegalese farms are performing better and have lower costs of production which further supports the infant industry argument.

Key findings: Trade policies in Ghana

In 2020, Ghana placed a partial ban on poultry imports from the Netherlands, Germany, Russia, and the UK due to avian influenza outbreaks. The findings show that imports of corresponding products do not change significantly due to the partial ban. The partial ban causes the export shares of US and Eastern European countries to increase in the sectors of 'poultry meat and eggs' and 'breeding animals' of Ghana. Furthermore, we simulate the effect of increasing the tariff rate on the final product to the maximum tariff that is allowed for Ghana under WTO-rules (i.e. 99%), abolishing the tariff rate of feed products (maize), and a complete ban of poultry meat imports. The results reveal that increasing the tariff rate to 99% and a complete ban have larger effects on the value chain and cause domestic production to increase by up to 104% and 254%, respectively. Due to the low tariff rate, the abolishment of tariffs for feed ingredients (maize) has almost no effect on agricultural trade or production costs and thus on the domestic production level. The study also shows that in the short term, large-scale farms are better positioned to take advantage of the tariff increase or an import ban, while small and medium farm types are expected to gradually increase their production. On the consumer side, the availability of poultry meat would be reduced with these policies.

Key findings: Agricultural policies in Ghana

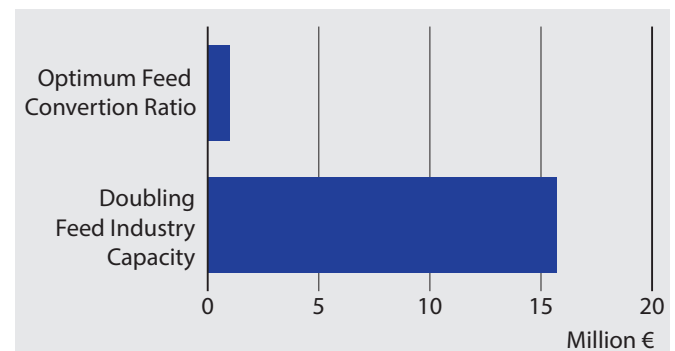
The farm economic analysis identified feed costs as a significant factor in the competitiveness of the poultry sector in Ghana. In this line, we investigated the key drivers of high feed costs in conventional broiler production in Ghana and examined the possible scenarios to reduce them. We began with increasing feed production capacity which has the effect of reducing feed prices as

supply increases. The reduction in production costs will finally be passed through to the broiler industry. Specifically, doubling the feed industry capacity may lead to decreasing the chicken meat price by around 30%. This policy provides a positive net welfare effect on the whole value chain (Figure 6.1.1). However, this policy may drive higher demand (and price) for soybean and maize which is a staple food in West Africa.

Furthermore, we investigate the effects of the feed-use efficiency proxied by the Feed Conversion Ratio (FCR). Our farm economic analysis suggests that all broiler farm types (small, medium, large) are inefficient in terms of feed use. The broilers consume more feed than they are supposed to and this contributes to high feed costs at farm level. However, improving broiler FCR has a slightly positive effect on consumers and producers at the macro level, and thus the net welfare effect on the poultry value chain remains marginal in response to this policy (Figure 6.1.1).

What policy measures can be implemented to reduce feed costs and increase production? Here, we develop

Abbildung 6.1.1: Net welfare effects of poultry value chain



Source: Own survey and calculations.

a policy scenario in which we subsidise feed for poultry production. The amount of the subsidy is equal to the tariff revenue generated by imported poultry meat. Currently, Ghana levies a 35 % tariff on poultry meat imports and generates tariff revenue that could be used to support the domestic poultry industry. If the tariff revenue is used entirely as a feed subsidy, domestic production could increase as much as 221% with prices for consumers decreasing by 24 % and an increase of poultry meat consumption by 14 %.

Conclusions

- ◆ The export restrictions like a partial ban on exports from one region, e.g. Germany or the EU would hardly reduce the imports of poultry because imports would then just be redirected to other countries (e.g., the USA or Brazil).
- ◆ A total ban or an increase of tariffs on imports could increase domestic production, while it reduces the availability of poultry meat to consumers.
- ◆ Since Senegal is a member of the World Trade Organization (WTO), it will possibly not be able to maintain its ban indefinitely. Our farm-level analysis suggests that the ban should not be lifted at once but gradually. During the period of a gradual decline in protectionist measures, policymakers may need to take into account special initiatives aimed to support small-holder broiler farmers. The international community under the WTO should not push for a quick opening and support a gradual approach over a long time period. Additionally, the policy support in the poultry sector should be shifted to the feed sector for the period when the ban is lifted.

- ◆ Agricultural policies should focus more on reducing production costs which enable producers to become more competitive. Encouraging the private sector to invest in the feed may significantly reduce feed costs by increasing feed supply. This goal can be achieved by using improved seeds; expanding the area of land under irrigation; promoting post-harvest handling practices; promoting private investment by providing low-interest rate credits.
- ◆ Ghanaian farms may reduce the costs of feed by improving their feed-use efficiency but this will require the use of good quality inputs (feed and chicks) and proper husbandry practices.



Plucking a broiler chicken at a local market in Ghana



Poultry farm in Senegal

Literature

Zamani O, Chibanda C, Pelikan J (2022) Impacts of import restrictions on poultry producers in Ghana. *Q Open*, 2(1), <https://doi.org/10.1093/qopen/qoac007>

Zamani O, Chibanda C, Pelikan J (2022) Investigating Poultry Interventions in Ghana and Senegal. 25th Annual Conference on Global Economic Analysis. https://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=6574

- ◆ Scarce water resources and the harsh climate are constraints for the domestic production of milk in Ghana and Senegal.
- ◆ Restricting imports would reduce the availability and accessibility of dairy products.
- ◆ Genetic improvement policies through Artificial Insemination projects have been the main policy in the dairy sector of Senegal and increased production by 80,000 tons in 2018.
- ◆ The Ghanaian dairy sector does not feature prominently in economic planning or agricultural policies.

Omid Zamani, Mavis Boimah, Anoma Gunarathne, Janine Pelikan

Background and aims

This chapter summarises the fifth work package of the project IMMPEX. It represents a summary of the impact analysis of dairy policies in Senegal and Ghana.

In both countries, the self-sufficiency rate of dairy products is very low. In 2018, it was 29% in Senegal and 15% in Ghana. The past 20 years show a strong increase in imports and a smaller growth in domestic milk production in both countries. While in Senegal local milk production is more important and on a higher level, domestic production in Ghana is low. To increase domestic production, Senegal has implemented agricultural policies that mainly target the genetic improvement of local breeds of cattle. Ghana's policy interventions are minor in that sector. Here, the main goal is to produce beef rather than milk. On the trade policy side, both countries only have a few import restrictions (tariffs in the range of 5% to 20%) so far because on the one

hand imported products like milk powder are used in the value chain and processed into final dairy products (value added). On the other hand, domestic producers might not be able to meet the demand. More specifically, we intend to assess two policy effects; a) domestic policies in the Ghanaian dairy sector, and b) artificial insemination projects in the Senegalese dairy production.

Data and methods

Due to limited data availability, empirical analysis of policy effects in Ghana and Senegal is a difficult task. To overcome this challenge in our analysis, we use the Synthetic Control Method (SCM) to evaluate the potential effects of the policy interventions on the dairy sectors of Ghana and Senegal. We use the annual panel dataset to evaluate the policies. The data is taken from the FAO and the World Bank.

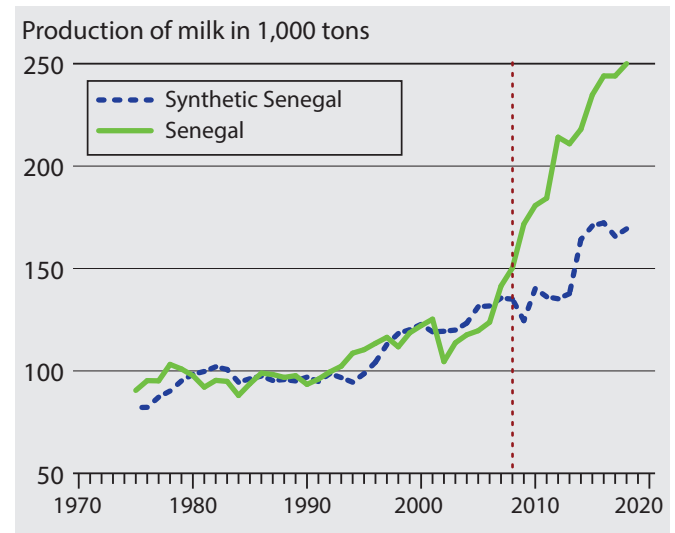
Key findings in Senegal

Senegal has implemented two consecutive Artificial Insemination programs since 2008. These programs include the Special Artificial Insemination Program (PSIA) and the Dairy Industry Development Support Project (PRADELAIT). Our findings indicate that the domestic production of milk has increased after the Artificial Insemination projects were implemented in 2008 (Figure 6.2.1). The gap between the observed production and synthetic (estimated) Senegal demonstrates the potential positive effects of the Artificial Insemination projects. In 2018 80 thousand tons of additional milk supply can be attributed to the Artificial Insemination projects. From 2008 to 2018 the production of milk grew by 66% in total. Most of the growth (40%) can be attributed to the Artificial Insemination projects.

The production objective of the PSIA was to obtain additional milk production in Senegal of up to 400 million litres by 2012. The SCM results imply that only 20% of the initial objective were achieved by 2012. Despite its positive effect, the lower yield of milk production could be partly caused by low feed quality and animal health. Besides, the dairy sector of Senegal has been facing several challenges including water resource scarcity and harsh environmental conditions. Due to water resource shortage, herder, especially in the northern region, rely heavily on groundwater, as the average rainfall is low and erratic.

Water used in milk production includes both drinking water for cattle and water used to produce animal feed. In this context, we consider blue water, which is used to water animals, as well as green water, which is the sum of soil evaporation and plant transpiration, which is primarily related to feeding animals. We calculate the water required for implementing Artificial Insemination

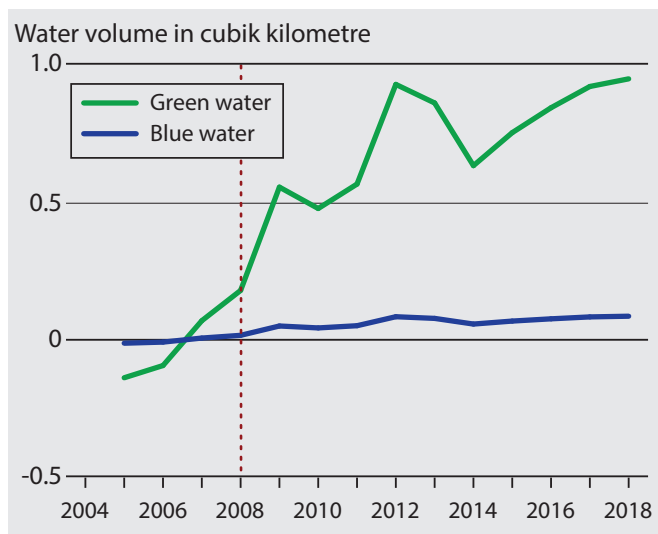
Figure 6.2.1: Actual milk production of Senegal vs. synthetic, Senegal



Source: Own calculations.

projects in Senegal from 2008 to 2018 using the water footprint of fluid milk estimated by the literature. Figure 6.2.2 presents the volume of water required to achieve the outcome of the Artificial Insemination projects from 2008 to 2018. In total, 0.84 km³ of extra water was required, consisting of 0.07 and 0.77 km³ of blue and green water respectively. In 2018, the total extra water required for Artificial Insemination projects accounted for 5% of annual agricultural water withdrawals in Senegal. It is worth noting that apart from the positive effects of Artificial Insemination projects on domestic production, there is still a huge gap between total imports and production in Senegal. To bridge this gap by reducing the dependency on imports, more water resources might be required, which is a serious constraint for domestic production.

Figure 6.2.2: Extra water required for Artificial Insemination projects



Source: Own calculations.

Furthermore, the maximum tariff that is allowed for Senegal under WTO rules (i.e. bound tariff rate) is set for dairy products between 15 % and 30 %. This means that Senegal would be able to gradually raise these tariffs without violating WTO rules. This policy, however, would have a negative effect on the availability of dairy products.

Key findings in Ghana

We find that over the entire period of 2002 to 2015, actual domestic milk production in Ghana remains relatively constant. Overall, the public interventions in Ghana's dairy sector are minor and thus we do not expect significant progress in milk production due to domestic policies. There are two reasons backing up this hypothesis:

Firstly, the dairy sector does not feature prominently in economic planning or agricultural policies in Ghana. Furthermore, the implemented policies primarily addressed non-production issues in the dairy sector. Second, cattle producers' main goal is to produce meat (beef) rather than milk. The maximum tariff that is allowed for Ghana under WTO rules is set for dairy products between 40 % and 99 %. This means that Ghana would have the possibility to further increase these tariffs without violating WTO laws. However, this policy would have negative effects on the availability of dairy products.

Conclusions

- ◆ In Senegal, the objectives of Artificial Insemination projects may not be achieved mainly due to harsh environmental conditions and water resource shortages.
- ◆ Since the drought-tolerant breeds are not typically high-yielding dairy cattle, domestic demand can only be met by imports. This can help to save water resources and increase the availability and accessibility of dairy products in Ghana and Senegal – especially in the dry season.
- ◆ Protectionist measures such as trade bans or an increase in tariffs on imported dairy products would reduce the availability and accessibility of dairy products.



Dairy cattle in Senegal

Literature

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Zamani O, Chibanda C, Boimah M, Asante Addo C (Forthcoming) Policy Effects and Coherence in the Agricultural Sector of Developing Countries: Evidence from Ghana

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