

Effects of a Partial Ban on Papua New Guinea's Imports of Poultry Products

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Introduction

In 2023, Papua New Guinea introduced a partial ban on poultry imports from Australia and Asian countries (representing about 70 percent of total PNG poultry imports) in response to the biosecurity threat posed by Avian Influenza (bird flu).¹ Such a restriction on supply has the potential to lead to sharp price increases, steep reductions in household consumption and greater food insecurity.

This memo presents an overview of PNG's poultry sector and describes an analysis of the effects of these trade restrictions on poultry prices, production and consumption using a partial equilibrium model of PNG's poultry sector. This new analysis builds on earlier work (Dorosh and Schmidt, 2023) that explored the implications of a *total* ban on poultry imports, by simulating the impacts of a *partial* poultry ban, including the effects on various household groups within PNG.

The Poultry Import Ban: Policy Context

Raw poultry or uncooked meat is prone to spread avian influenza virus disease through bacteria (*Campylobacteria*) present in chicken (Rodigo, 2015). While there has been little documented history of the disease in Australia or in PNG (Jonduo et al., 2013), there are substantial perceived risks of an outbreak of this disease. One major factor is consumers' low compliance with recommended food safety practices, an important contributor to *campylobacteriosis* in New Zealand (Sakkaf, 2021). Moreover, PNG has limited capacity for regulatory prevention and mitigation of an outbreak, in terms of poultry handling practices, health diagnostics and consumer awareness. Thus, a potential outbreak in PNG could have substantial adverse socio-economic and health effects (Jonduo et al., 2013).

Different regulatory standards of various exporting countries are a major reason for PNG's partial import ban on poultry. In response to the spread of a new Avian influenza (bird flu) in 2021, PNG imposed an import ban on poultry imports from Australia and Asian countries in 2023 (Nangoi, 2023). New Zealand's poultry exports to PNG were not suspended, however.²

Poultry Consumption Patterns

Rapid growth in the PNG economy and population has led to increased demand for animal-sourced foods such as pork, poultry, and eggs. Domestic production of animal-sourced foods, and in particular, poultry meat, has not kept up with demand. Thus, poultry meat imports have increased rapidly.

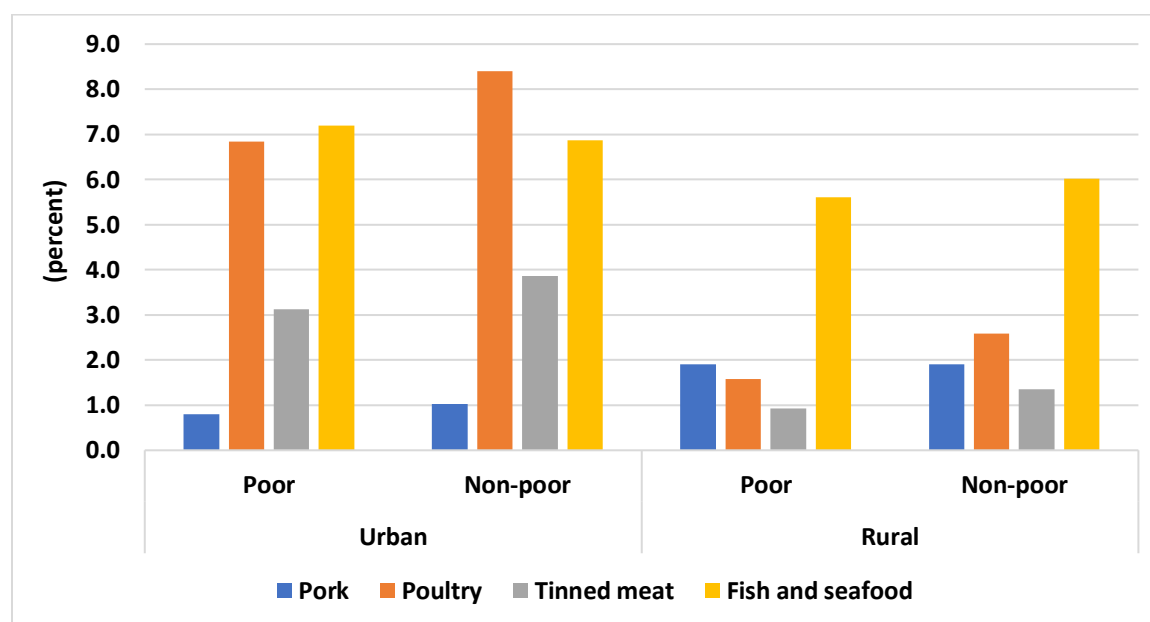
Expenditures on poultry are the highest among the animal-source foods for the urban non-poor (8.4 percent of expenditures) and second highest for the urban poor (6.8 percent), similar to the budget shares of fish and seafood in urban areas (7.2 percent for the poor and 6.9 percent for the non-poor) (Figure 1). Shares of poultry in total food expenditures are far lower for rural households (2.6 and 1.6 percent for the non-poor and poor rural households, respectively).

¹ As of December 2023, it was not clear to what extent the ban had been enforced (Post Courier, 2023).

² Note that New Zealand has a reputation for high standards in food safety (IFDC, 2021).

Budget shares for fish and other seafood in rural areas (6.0 percent for the nonpoor and 5.6 percent for the poor) are nearly the same as in urban areas.³

Figure 1: Shares of Various Animal Source Protein Foods in Total Food Expenditures in PNG



Source: HIES 2009/10 and authors' calculations.

Nonetheless, the average consumption of protein rich foods in PNG remains insufficient to meet nutrition guidelines, especially in rural areas. For example, data from the PNG Rural Survey on Food Systems (IFPRI, 2018) reveals that about half of the rural sample in Momase region consumed less than the recommended protein quantity (Schmidt et al., 2020).

Overall, urban households consumed about half the poultry meat in PNG despite comprising only 15 percent of the total population (Table 1 and Figure 2). Per capita consumption in urban areas is thus significantly higher for both the urban poor and non-poor (8.5 and 20.3 kgs/person/year) than for the rural poor and non-poor (only 0.2 and 4.2 kgs/person/year). More recent, nationally representative data on household food consumption is not available. However, given the surge in poultry imports over the past decade, it is likely that the concentration of poultry consumption in urban areas is even greater than in 2009/10.

It should be noted that the prices of domestically produced poultry meat in PNG are considerably higher than the prices in neighboring Indonesia. The retail price in PNG in 2019 was about \$8 per chicken (\$4.2/kg for live weight and \$5.7/kg for dressed weight), (Schmidt et al., 2023; Kosec et al., 2022). In Indonesia in the same year, the retail price of live chicken was \$1.5/kg, about one-third the price in PNG (USAID, 2013; Mehta and Galgal, 2019; Nugroho, 2020).

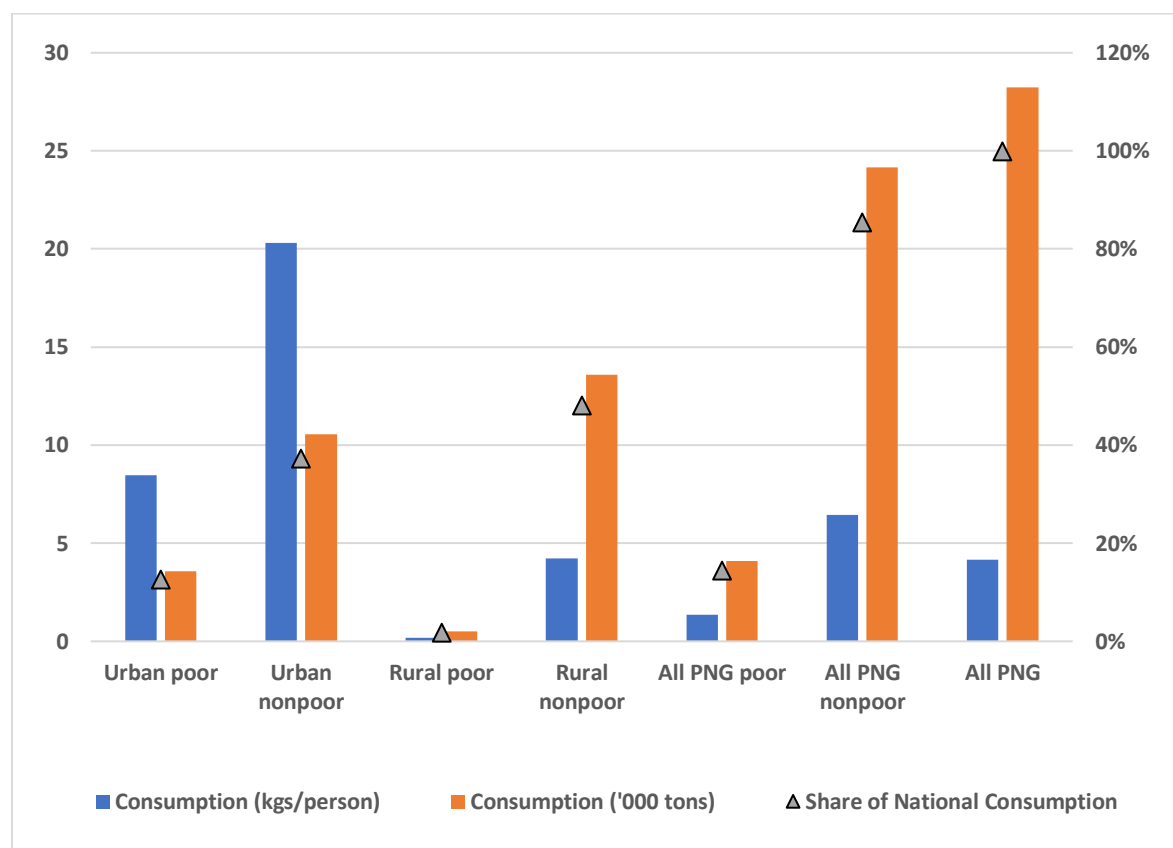
³ Budget share includes the market value of own produced or own caught/captured food items that are consumed by the household.

Table 1: Poultry Consumption in PNG by Household Group, 2009-10

	Urban Poor	Urban Non-poor	Rural Poor	Rural Non-poor	All PNG Poor	All PNG Non-poor	All PNG Total
Consumption / person (kgs)	8.5	20.3	0.2	4.2	1.3	6.5	4.2
Consumption ('000 tons)	3.6	10.6	0.5	13.6	4.1	24.2	28.2
Consumption Share	12.7%	37.4%	1.8%	48.2%	14.5%	85.5%	100.0%
Consumption (mn kina)	3.58	10.55	0.51	13.60	4.09	24.15	28.24
Consumption / person (kina)	97.3	208.7	12.7	39.5	24.4	62.9	45.7
Food consumption (mn kina)	600.1	1,289.4	2,086.5	4,933.2	2,686.6	6,222.6	8,909.2
Share of food (percent)	6.8%	8.4%	1.6%	2.6%	2.8%	3.8%	3.5%
Food consumption / person (kina)	1,423	2,483	801	1,530	888	1,662	1,316

Source: HIES 2009-10 data and authors' calculations.

Figure 2: Poultry Consumption in PNG by Household Group, 2009-10



Source: HIES 2009-10 data and authors' calculations.

Poultry Production and Marketing

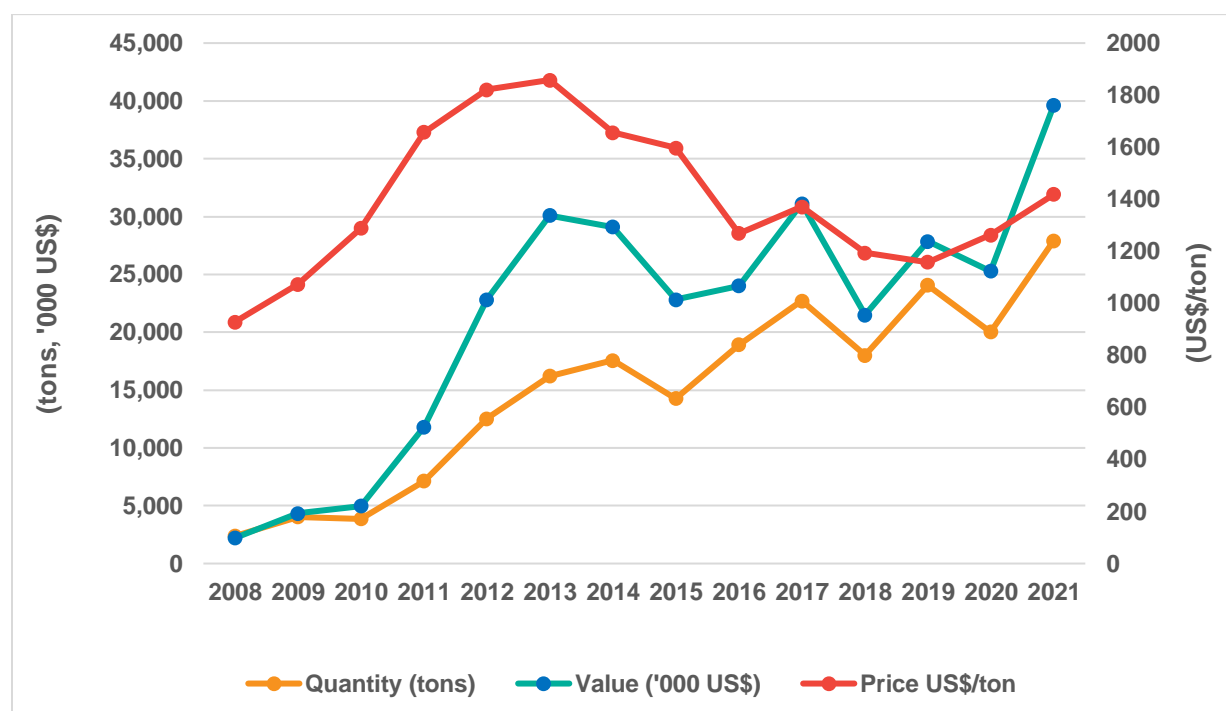
PNG domestic poultry production is dominated by two major suppliers, *Zenag* and *Niugini Tablebirds*. Both companies are headquartered in Lae, offering facilitated port access which is necessary to reduce transaction costs of imported poultry inputs. These two producers are also the primary suppliers of broiler poultry inputs, such as day-old-chicks (DOC) and livestock feed. Both *Zenag* and *Niugini Tablebirds* manage every node of the commercial poultry value chain, whereby they either produce their own poultry or contract poultry out-growers and supply them with DOC, feed, and necessary training to ensure quality poultry rendering. About 70 and 50 percent of the production of *Tablebirds* and *Zenag*, respectively, are supplied by domestic out-growers (Mehta and Galgal, 2019).

While the out-grower model of poultry production is efficient given that the commercial-oriented companies are vertically integrated, poultry inputs and poultry supply are geographically constrained because the primary suppliers (*Zenag* and *Tablebirds*) are solely located in Lae. Households and communities further from Lae face greater costs for poultry production, quickly outweighing the benefits of wider domestic production. Thus, outside of the surrounding areas of Lae, most poultry production is small scale and oriented towards subsistence or low-volume wet market sales.

PNG's Poultry Imports

The total volume of chicken meat imports, which accounted for 68 percent of total supply in 2020⁴, has grown steadily over time (Figure 3). The quantity of chicken meat imports in 2021 was more than ten times that of 2008 (27.9 and 2.4 thousand tons, respectively). The average price of chicken imports has remained relatively stable in nominal terms in recent years, ranging from \$1.16/kg to \$1.42/kg, from 2016 to 2021. As a result, the value of poultry imports has risen steeply, along with the increase in quantities.

Figure 3: PNG Poultry Imports, 2008-2021

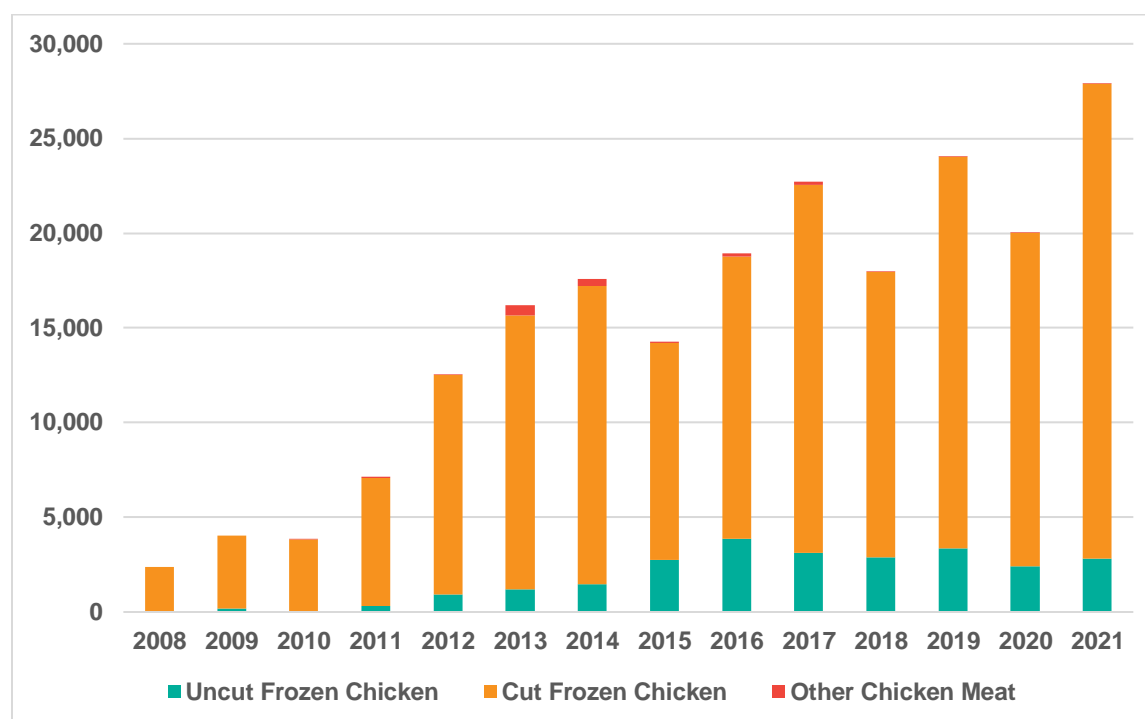


Source: Calculated from COMTRADE (2023) data.

Most of these imports of chicken meat are in the form of cut frozen chicken, which accounted for 85.6 percent of supply from 2016 to 2021. Uncut frozen chicken accounted for 14.0 percent of the trade; other forms of chicken meat imports were only 0.4 percent of the total value of the chicken meat imports in this period (Figure 4). In 2021, PNG was the largest importer of poultry meat, comprising 35.2 and 34.9 percent of frozen poultry meat exports from Australia and New Zealand, respectively.

⁴ The FAO Food Balance Sheet for PNG for 2020 shows 7.0 thousand tons of domestic production and 23.0 thousand tons of imports and a drawdown of 4.0 thousand tons of stock. Thus, imports were 77 percent of the total of production plus imports, and 68 percent of supply including stock drawdown.

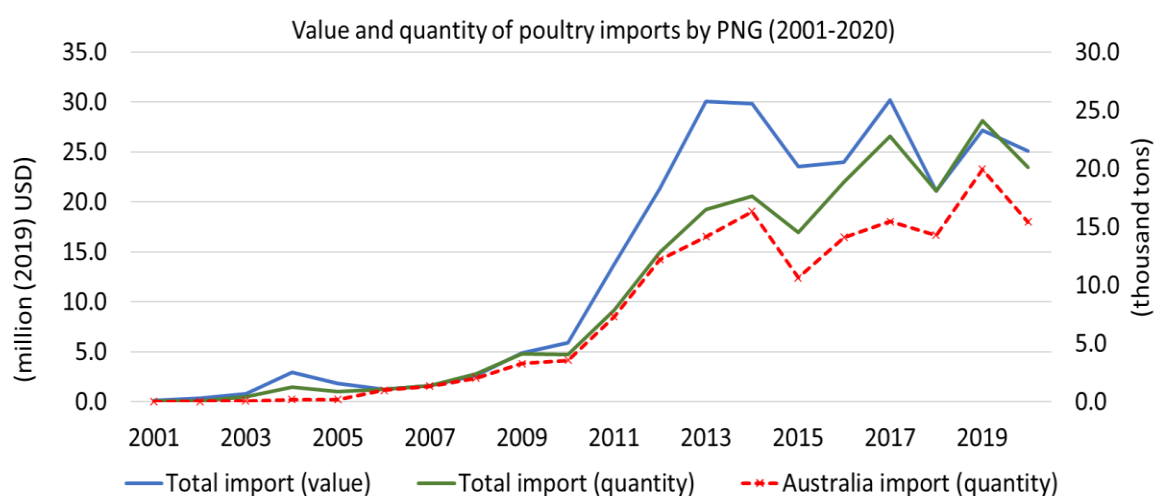
Figure 4: PNG Imports of Chicken by Type, 2008-2021



Source: COMTRADE (2023) data.

Prior to 2015, however, nearly all of PNG's poultry imports were sourced from Australia, and Australia still accounted for about three three-quarters of PNG's imports from 2018 to 2020 (Figure 5).

Figure 5: PNG Value and Quantity of Poultry Imports (Total and from Australia), 2001-2020



Source: Kosec et al. (2023); calculated from BACI (2022) international trade database.

Authors' calculations using BACI International trade database at the product level (2022).

Potential Effects of a Partial Import Ban and an Import Tariff: Model Results

To quantify the potential effects of restrictions on poultry imports (such as the ban on imports from Australia and select Asian countries), we use a simple model of poultry meat supply and demand. The model, based on estimates for production, imports and consumption from the FAO Food Balance Sheets of 2021, calculates the change in price of poultry meat required to balance estimated supply (production plus imports) and demand (consumption). Household demand parameters for the model are based on estimates using data from the 2009-10 HIES.

Table 2 and Figure 6 show the simulated effects of a ban on poultry imports from Australia and Asian countries that reduces total poultry imports by 70%, from 23,000 tons to 6,900 tons (assuming no increase in PNG imports from other countries to compensate for the effects of the ban).

Table 2: General Effects of the Poultry Partial Import Ban: Model Simulations

	Base	S-Run	L-Run
Market Price	---	84.1%	49.7%
Production ('000 tons)	7.00	10.1	10.9
(% change)		44.2%	55.9%
Consumption ('000 tons)	34.0	21.0	21.8
(% change)		-38.2%	-35.8%
Imports ('000 tons)	23.0	6.9	6.9
(% change)		-70.0%	-70.0%

Source: Model simulations.

Figure 6: General Effects of the Poultry Partial Import Ban: Model Simulations



Source: Model simulations.

Simulation 1 shows the short run effects of an import ban modeled using relatively inelastic demand and supply parameters.⁵ Given the simulated 70% reduction in imports and the corresponding reduction in supply, domestic poultry prices increase by 84%. The higher prices encourage domestic production, which rises by 44%, from 7.0 to 10.1 thousand tons. Nonetheless, poultry consumption decreases by 38%.

In the long-run, domestic poultry prices increase by only 50%, compared to 84% in the short-run case, because with more elastic supply and demand, smaller price changes are sufficient to balance supply and demand (as compared to Simulation 1). Thus, domestic production rises slightly more than in the short-run case (56% versus 44%), and poultry consumption decreases by 36% (instead of 38% as in Simulation 1).

Table 3 and Figure 7 shows household level impacts for the two simulations. Poultry consumption of urban non-poor households falls by 32% in the short run, from 19.3 thousand tons to 13.1 thousand tons. The drop in their consumption is similar in the long run, as well. For urban poor households, however, poultry consumption decreases by a larger percentage (46%), falling from 8.0 thousand tons to 4.4 thousand tons. In the long run, their poultry consumption falls by a slightly smaller magnitude (43%).

For the rural poor, poultry consumption decreases by 52% in the short-run, from 1.67 thousand tons to 0.80 thousand tons, and by 45% in the long run, from 1.67 thousand tons to 0.91 thousand tons. Similarly, poultry consumption of the rural non-poor decreases by 46%, from 5.01 thousand tons to 2.72 thousand tons in the short run. Poultry consumption decreases by less (41%) in the long run given that households adjust their demand and domestic production adjusts (albeit slowly) in response to higher prices.

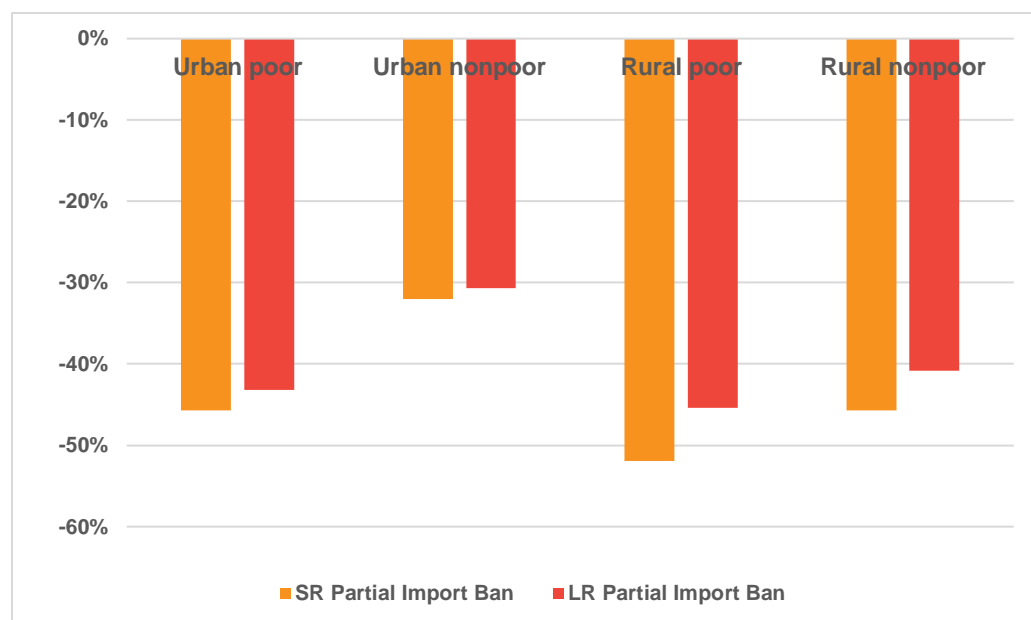
Table 3: Household level Effects of the Poultry Partial Import Ban: Model Simulations

	Short-run	Long-run
Urban poor	-45.7%	-43.2%
Urban nonpoor	-32.0%	-30.7%
Rural poor	-51.9%	-45.4%
Rural nonpoor	-45.7%	-40.8%
Total	-38.2%	-35.8%

Source: Model simulations.

⁵ That is, parameters that specify relatively small changes in quantities of demand and supply in response to changes in prices and incomes. This assumption may reflect short-term changes in quantities of supply and demand. In the long run, as producers and consumers adjust to price changes, larger changes in quantities supplied and demanded can be expected.

Figure 7: Household level Effects of the Poultry Partial Import Ban: Model Simulations



Source: Model simulations.

Conclusion

In order to reduce the probability of an outbreak of Avian influenza, PNG has placed a ban on imports of poultry from Australia and select Asian countries. Given that these imports accounted for 70 percent of total imports in recent years, such a reduction in supply has serious economic implications.

Model simulations indicate that a reduction in poultry imports could result in an 84 percent increase in poultry prices in PNG in the short run. In the long run, the price increase may be limited to 50 percent, as consumers find alternatives to poultry consumption and producers shift some of the resources that had been devoted to short-run increases in production of poultry to production of other goods and services. Nonetheless, consumption of poultry products could fall by about 30 percent for both the urban poor and nonpoor households.

The adverse nutritional consequences of such a decline could be severe since poultry is a major source of animal protein consumption for many people in urban areas, and animal source protein consumption is already insufficient to meet nutrition guidelines for many households throughout PNG. Thus, it is important, in the short term, to encourage additional poultry imports from countries whose poultry products meet PNG import guidelines, and in the long term to increase productivity and reduce costs in PNG's domestic poultry industry.

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