

Supplementary Information

An outbreak of highly pathogenic avian influenza H5N1 could impact the dairy cattle sector and the broader economy in the United States

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December 18, 2025

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Supplementary Table 1: Aggregated GTAP classifications

Regions	Sectors	Factors of Production
United States	Raw Milk	Unskilled labour
Canada	Dairy Products	Skilled labour
Mexico	Meat Products	Capital
Oceania	Cattle	Land
Africa & Middle East	Grain & Crops	Natural Resources
East Asia	Other Meats	
Other Asia	Processed Food	
Latin America	Manufacture	
Western Europe	Other Sectors	
Rest of the World		

Note: Author's aggregation of regions, sectors, and factors of production based on the GTAP 11C (2017) database.

Supplementary Table 1 shows both the country and sectoral disaggregations. Our final disaggregations contain 10 regions, 9 sectors and 5 factors of productions. The GTAP model analyses separately countries interconnected by trade, to account for the global economy. Apart from the USA, we discuss two other countries, Canada, Mexico, because they are the US's biggest trading partners for dairy products⁶ and beef⁷. The remaining countries are aggregated into regions as follows: Oceania, East Asia, Latin America, Western Europe, Other Asia, and Africa & Middle East countries. All other countries are aggregated into 'Rest of the World'.

Concerning sectors, GTAP's nested production functions account for the full supply chain of given sectors. In this analysis, we specifically focus on economic sectors Raw Milk, Dairy Products, Meat Products, and Cattle as well as different component of the food supply chain (Supplementary Tables 1 and 2). In the GTAP database, the Meat sector comprises mainly beef, but also meat from buffalo, sheep, goat, camel, horses, and other mammals. Poultry is a separate sector. The model does not allow to disentangle other meat from beef, however, consumption of other meats is small by comparison. The per person consumption of beef in the United States was 37.81 kg in 2021, compared to consumption of sheep and goat meat of 700 grams, and other meats 920 grams⁸ (this is meat other than beef, poultry, pig meat, sheep, goat, fish and seafood). A more detailed description of each sectors is given below:

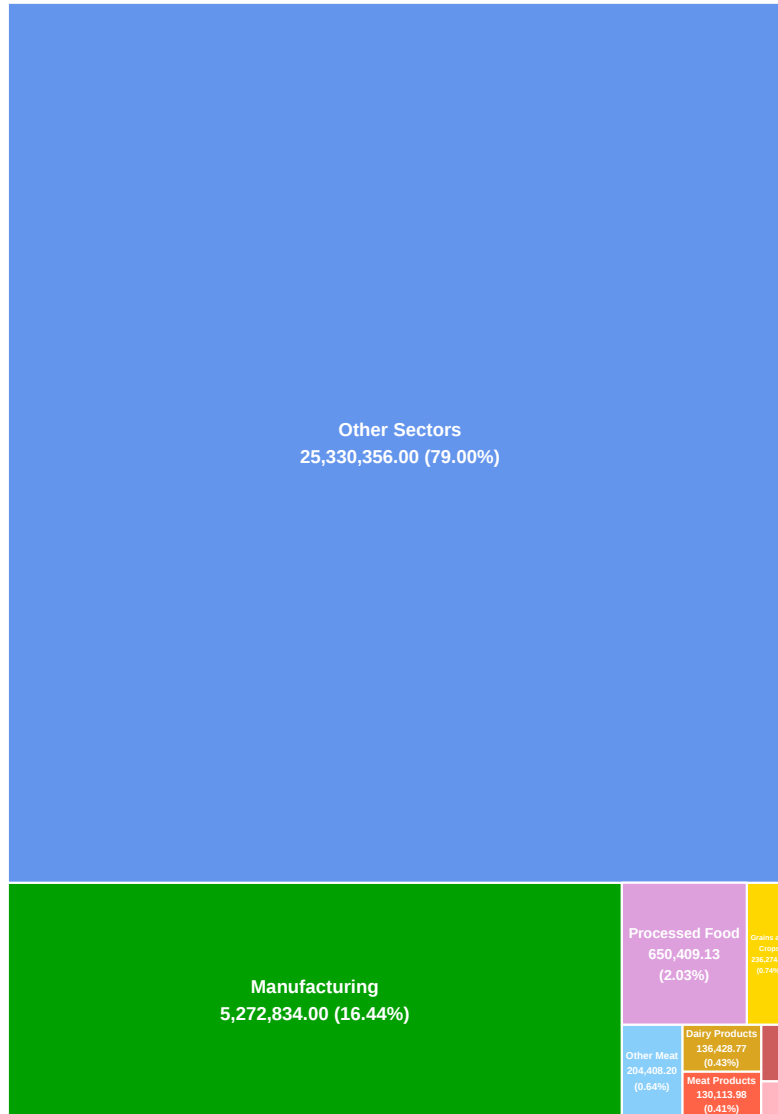
Supplementary Table 2: Descriptions of GTAP economic sector classifications

Name	Code/Sectors	Description
Raw Milk	11: rmk	Raw milk
Dairy Products	22: mil	Milk: dairy product
Meat Products	19: cmt	Cattle Meat: fresh or chilled; meat of buffalo, fresh or chilled; meat of sheep, fresh or chilled; meat of goat, fresh or chilled; meat of camels and camelids, fresh or chilled; meat of horses and other equines, fresh or chilled; other meat of mammals, fresh or chilled; meat of mammals, frozen; edible offal of mammals, fresh, chilled or frozen
Cattle	9: ctl	Cattle: bovine animals, live, other ruminants, horses and other equines, bovine semen
Other Meats	4 sectors	oap wol fsh omt
Processed Food	3 sectors	sgr ofd b.t
Grain & Crops	9 sectors	pdr wht gro v.f osd c.b pfb ocr pcr
Manufacture	19 sectors	tex wap lea lum ppp p.c chm bph rpp nmm i.s nfm fmp ele eeq ome mvh otn omf
All Other Sectors	26 sectors	frs coa oil gas oxt vol ely gdt wtr cns trd afs otp wtp atp whs cmn ofi ins rsa obs ros osg edu hht dwe

Note: Author's aggregation of sectors. For the full list of GTAP sector classifications, see the [GTAP Sectoral List](#) on the GTAP website.

Supplementary Tables 1, and 2 show respectively the chosen aggregations for this analysis and all components of the aggregated sectors. This aggregation allows us to observe all consequences of H5N1 on different agricultural sectors, as well as the spillover effects on the food supply chain and the non-agricultural sectors. Inter-sectoral linkages in the GTAP model are defined by nested CES/CET production functions, trade and household adjustments (elasticities, etc.). Through these channels, a shock to the agricultural sectors, such as an H5N1 outbreak, propagates throughout the economy by modifying relative prices and factor allocation, affecting non-agricultural sectors. Non-necessary sectors are all aggregated into one category *Other sectors* accounting for 26 sectors. Supplementary Figure 2 describes the share of economic sectors in our current aggregation of the GTAP model, in terms of Output Quantities (qo) contribution to the US economy. It's important to acknowledge that reducing sectoral detail can introduce aggregation bias^{9,10}. Consequently, even if the directly shocked sectors are correctly identified, this loss of granularity can lead to the under- or overestimation of indirect effects and spillovers.

Supplementary Figure 2: Sectors contribution to total Output Quantities (qo)



Note: Values represent total output per sector in millions \$, while percentages indicate each sector's relative share of the total within the current aggregation of the GTAP 11C database.

Since the U.S. is not an agrarian economy, we observe in Supplementary Figure 2 that the agricultural and related sectors are relatively small compared to manufacturing and services. This shapes the macroeconomic results: even modest spillovers into large sectors such as manufacturing or services can generate sizeable aggregate effects. At the same time, large distortions can occur at the sectoral level without being fully visible in the macroeconomic outcomes, as they are diluted within the much larger non-agricultural sectors. To account for this, we present both macroeconomic and sectoral results.

Supplementary 1.2 The GTAP model

The GTAP model assumes a constant elasticity of substitution (CES) production function. A CES production function describes how a firm combines inputs like capital and labour to produce output, allowing for a constant degree of substitutability between those inputs. The CES function allows one to control the ease of substituting one input for another by adjusting a single parameter. This makes it useful for modelling economies where inputs are not perfectly interchangeable. Depending on whether the elasticity is high or low, it will be easier or harder to substitute one input for the

other. Producers are assumed to minimise costs of producing goods and services, given constraints, for example, by available machinery and production technology. In our variant of the model, we calibrate the elasticity of transformation (ETRAE) to match the value typically used for land. This adjustment helps constrain the reallocation of inputs across sectors, in line with the methodology proposed in the literature¹¹. According to our value of ETRAЕ, the model allows other factors of production to reallocate across sectors in response to the H5N1 shock, though this mobility is imperfect as we are running a short to medium term analysis. A final assumption is that productivity is only affected directly by the shock and not through any indirect channels. ETRAЕ is the only elasticity that we modify due to high uncertainty in consumer reactions, however, we conduct a full sensitivity analysis on relevant elasticities (Supplementary 5.2).

The model derives an equilibrium where all demand equals all supply, for given prices for all inputs and outputs. A shock to this equilibrium, here the H5N1 outbreak, impacts some components of the model directly. For example, mandated testing of dairy cows is an external shock that we translate in an increase of the costs of producing dairy products. Testing is an additional task that dairy farmers have to undertake, which means that they have less time to spend on their core tasks. This increases the labour input needed for every unit of dairy output produced, i.e. decreases efficiency of production. As a result, more workers are needed to do the same tasks. Other components of the model are affected more indirectly; for example, increase in labour demand in the agricultural sector are mirrored in other economic sectors. The GTAP model captures inter-sectoral linkages without explicitly modelling specific interventions such as testing or protective measures. Instead, we incorporate their estimated effects, sourced from the literature, by applying shocks to relevant variables.

In the GTAP framework, the model closure plays a crucial role. It allows the modeller to determine which variables are treated as exogenous and which as endogenous. This flexibility enables the model to be adapted to different scenarios, such as different time horizons or types of shocks. Our closures are described in Supplementary Table 3:

Supplementary Table 3: Scenario closures and swap conditions by scenarios

Scenario	Swap conditions
S1	swap qe("UnSkLab",REG) = pebfactreal("UnSkLab",REG);
S2	swap qxs("Drp","US",REG) = tms("Drp","US",REG); swap qxs("Meats","US",REG) = tms("Meats","US",REG); swap qxs("Rwmk","US",REG) = tms("Rwmk","US",REG); swap qxs("Cattle","US",REG) = tms("Cattle","US",REG); swap qpa("Drp","US") = tpdall("Drp","US"); swap qpa("Meats","US") = tpdall("Meats","US"); swap qpa("Rwmk","US") = tpdall("Rwmk","US"); swap qe("UnSkLab",REG) = pebfactreal("UnSkLab",REG);
S3	swap qxs("Drp","US",REG) = tms("Drp","US",REG); swap qxs("Meats","US",REG) = tms("Meats","US",REG); swap qxs("Rwmk","US",REG) = tms("Rwmk","US",REG); swap qxs("Cattle","US",REG) = tms("Cattle","US",REG); swap qpa("Drp","US") = tpdall("Drp","US"); swap qpa("Meats","US") = tpdall("Meats","US"); swap qpa("Rwmk","US") = tpdall("Rwmk","US"); swap qe("UnSkLab",REG) = pebfactreal("UnSkLab",REG);

Note: All scenarios share the same GE closure: psave varies by region, pfactwld is the numeraire. Exogenous variables include population, psaveslack, pfactwld, technology shifters, endowment slack variables, tax wedges, etc.

In Supplementary Table 3, we change quantity variables (unskilled labour, demand, and trade) with

either taxes or real wages. First, this allows us to directly fix real wages, thereby enabling unskilled labour endowments to adjust approximating closely employment movement. This modelling choice is intended to reflect short- to medium-term dynamics, during which wages are typically rigid. Our approach follows the literature for incorporating wage rigidity and implementing different types of domestic and international demand shocks¹². Second, by swapping taxes with quantities, we can directly shock quantities, allowing for the implementation of targeted scenarios to reduce domestic and international demand¹³.

The GTAP model calculates all direct and indirect impacts of shocks, and estimates a new equilibrium, with different quantities and prices for all inputs and goods and services produced. The model is static, not dynamic. It compares an old to a new equilibrium but does not calculate the paths by which adjustments to the new equilibrium occur. Hence the GTAP model is suited to the evaluation of the effects of shocks in the short to medium-term¹⁴.

Supplementary 2 Scenarios

We calculate the economic impacts of three hypothetical scenarios, informed by estimates of the impacts of Bovine spongiform encephalopathy (BSE) in the 1980s and 90s, and the H1N1 pandemic in 2009 on the livestock sector in the US. For each scenario, we make assumptions on the epidemiological situation (Main text, Table 2), the change in domestic and export demand for raw milk, dairy products and beef, the change in government mandates with respect to moving and testing of cattle, treatment of affected milk, biosecurity measures, and some other key government interventions (such as wastewater surveillance).

Scenario S1 reflects the current situation. We assume there is no impact on the meat sectors or on trade and a very small one on the supply side of dairy and raw milk markets. **Scenario 2** reflects a realistic scenario where we assume the outbreak cannot be contained within the currently affected states, and where government interventions are stepped up. However, we assume that disease spread remains limited. We assume that key trading partners of the USA impose some (limited) import restrictions for US dairy products and beef products, and consumers and suppliers react to some extent across all markets with changed demand. **Scenario 3** reflects a reasonable-worst case situation which assumes widespread economic impacts of the disease comparable to previous outbreaks of H1N1 and BSE on the US economy (see Supplementary 3 for more details). There is heightened awareness of H5N1 in the public perception, causing both domestic and international demand collapse, while suppliers are now largely constrained by disease containment measures and cows' decrease in productivity due to sickness. The US government mandates more stringent restrictions on the dairy and beef meat agricultural sectors.

In all scenarios, we consider the costs of subsidies to farmers, and the costs of wastewater surveillance undertaken by the Centers for Disease Control and Prevention (CDC) in S2 and S3. However, we do not include other direct costs of US government interventions involved in the H5N1 response, notably the U.S. Department of Agriculture (USDA), the Centers for Disease Control and Prevention (CDC), and the U.S. Food and Drug Administration (FDA). We also do not consider the costs of non-governmental associations and organisations involved in the H5N1 response, such as the American Veterinary Medical Association (AVMA), and the costs of research and evaluation at Universities and Research Institutes in the USA and abroad.

Note that none of our three scenarios assume sustained human-to-human transmission; the reasonable worst-case scenario S3 assumes that there is the possibility that live virus in either ground beef or beef muscle enters the food supply. This is informed by an announcement made in May 2024 by the USDA that viral particles were detected in tissue samples, including diaphragm muscle, from one cow¹⁵. Signs of illness were detected in the infected animal during postmortem inspection and the USDA prevented the animal from entering the food supply.

Supplementary 2.1 Scenario S1 (current situation)

Epidemiological situation We assume that the current emerging evidence on transmission routes applies¹⁶. This means that nearly all transmission is occurring through contact - fomite - related to

milking. It has recently been found that H5N1 isolated from an infected human can transmit among mammals via respiratory droplets, though with limited efficiency¹⁷. We assume that the mandates that have been implemented in May 2024 (testing required to move lactating dairy cattle inter-state) can contain the outbreak to dairy cow farms in the 14 currently implicated states, including California. Further outbreaks are detected in these states, but they die out over the next year. None or just a few further human cases are detected.

Demand There is no reduction in demand (qpa) or exports for raw milk, pasteurised dairy products, or beef.

Interventions

- *Moving dairy cattle*: As effective of April 29th 2024, lactating dairy cattle that are moved between states need to be tested for influenza A, and lactating dairy cattle from a herd testing positive are not allowed to be moved for up to 30 days. Max 30 cows of a herd are tested.
- *Testing farm workers*: It is recommended that all workers on affected farms are tested;
- *Milking process*: It is recommended that in farms with dairy cattle that have tested positive, infected cows are isolated, and milking equipment is disinfected between each cow; farm workers on farms with infected cattle are recommended to wear PPE. According to the Pasteurized Milk Ordinance (PMO) most recent update from 2023, lactating animals which show evidence of the secretion of milk with abnormalities, based upon bacteriological, chemical or physical examination, shall be milked last or with separate equipment and the milk shall be discarded¹⁸. This implies that milk from ill (symptomatic) animals is being diverted or destroyed so that it does not enter the human food supply. It is recommended that milk is heat treated before disposal; only milk from healthy animals is authorised for distribution into interstate commerce for human consumption. Additionally, pasteurisation is required for any milk entering interstate commerce. This means production costs of milk increase substantially in affected farms, but not in farms unaffected by the outbreak.

Overall, we assume that the interventions make it slightly more expensive to produce milk and dairy products. The adverse impact on productivity ($aoall$) are assumed to be 5% (raw milk), 2.5% (dairy and live cattle), and 0% (beef).

Subsidy The testing and waste disposal costs are reimbursed by the USDA; the costs of disinfecting equipment and PPE are reimbursed; the milk from infected herds is being diverted or destroyed, for which the USDA reimburses lost income; there is a \$28,000 ceiling for subsidies to support biosecurity and compensation for lost milk per affected farm. The value of all subsidies is estimated (to) at \$98m, based on the most recent announcement by the U.S. Department of Agriculture on available funding to support biosecurity measures¹⁹.

Supplementary 2.2 Scenario S2 (realistic)

Epidemiological situation Most transmission is occurring through contact - fomite - related to milking, but transmission via aerosol is also occurring. The interventions that have been implemented in May 2024 (testing required to move lactating dairy cattle inter-state) cannot contain the outbreak to dairy cow farms in the currently implicated states, but other states are also implicated. Further outbreaks are detected in nearly all states, but they die out over the next year. Just a few further human cases are detected.

Demand There is an assumed 15% reduction in demand (qpa) for raw dairy products, a 10% reduction in demand for pasteurised dairy products, and a 5% reduction in demand for beef. There is a 75% reduction in export (qxs) demand for raw dairy milk and products, and 15% reductions in exports of pasteurised dairy products, beef and live cattle because of import bans by a few countries.

Interventions

- *Moving dairy and beef cattle:* there is the order that all dairy *and* beef cattle that are moved between states need to be tested for H5N1, and dairy *and* beef cattle testing positive are not allowed to be moved (even between farms in the same state). This means that there is a small reduction in the quantity of dairy and beef cattle traded on the market;
- *Testing cattle:* there is the requirement for all cattle farmers to test a sample (30-50 heads) of dairy and beef cattle for influenza A once per month; all affected farms need to safely dispose of infected milk, and of any dead cattle; this means production costs for dairy products increase moderately, because of testing cattle and disposing of infected milk safely.
- *Milking process:* in farms with dairy and beef cattle that have tested positive, milking equipment needs to be disinfected between each cow; farm workers on farms with infected cattle need to wear PPE; this means production costs of milk increase substantially in affected farms, but not in farms unaffected by the outbreak.
- *Surveillance:* The CDC is undertaking wastewater monitoring in a narrow to moderate radius surrounding farms where cattle have tested positive.

The interventions make it more expensive to produce milk and milk products. The adverse impact on productivity (*aoall*) are assumed to be 15% (raw milk), and 10% (pasteurised dairy and live cattle) and 5% (beef).

Subsidy The costs of the disinfection and PPE are fully reimbursed by USDA; the testing and disposal costs are fully reimbursed by the USDA. The subsidy together with the costs of wastewater surveillance are assumed at \$300m. This is based on an estimate available in the literature on potential farm sector effects of 2009 H1N1²⁰. At the time, the USDA bought about \$200 million worth of pork in 2009. The NPPC (the pork producer association) had asked for \$250 million at the time.

Supplementary 2.3 Scenario S3 (reasonable worst-case)

Epidemiological situation Transmission becomes aerosolised, and there is sustained cow-to-cow transmission, and occasional transmission from cows to other farm animals (including pigs) and farm workers; the interventions that have been implemented as of May 2024 (inter-state travel restrictions for lactating cattle that test positive) cannot contain the outbreak in dairy cow farms in the currently affected 13 states, and the outbreak spreads into beef herds and additional dairy herds across most US states. The government mandates tracking and travel restrictions and further cases of H5N1 infections in humans may be identified.

Demand There is an assumed 50% reduction in demand (*qpa*) for raw dairy products, and a 25% reduction in demand for pasteurised milk and beef, over one year; there is a 75% reduction in exported quantities (*qxs*) of dairy products and beef over one year, by a substantial number of countries.

Interventions

- *Moving dairy and beef cattle:* The US introduces with immediate effect a bill that includes mandates on electronic tracking for all dairy and beef cattle, as in European and other countries²¹; this has been proposed by USDA²². There is the order that dairy and beef cattle that are not electronically tagged are not allowed to be moved from their farm; there is the requirement to test for H5N1 one time per week, and dairy and beef cattle testing positive are not allowed to be moved from their farm (whether tagged or not). Because of delay with the adoption of the electronic tracking system, these measures together mean that there is a marked reduction in the quantity of dairy and beef cattle traded on the market for a few months;
- *Testing cattle:* there is the requirement for all cattle farmers to test a sample of dairy and beef cattle for H5N1 one time per week; where cattle have tested positive, the whole herd of dairy and beef cattle needs to be tested for influenza A; all affected farms need to safely dispose of infected milk, and of any dead cattle; this means production costs for dairy products increases, because of testing cattle and disposing of infected milk safely.

- *Milking process*: in farms with dairy and beef cattle that have tested positive and in farms in the vicinity of farms with infected cattle, milking equipment needs to be disinfected between each cow; farm workers on farms with infected cattle, and on farms in the vicinity of infected farms need to wear PPE; this means production costs of milk increase substantially in affected farms
- *Surveillance*: The CDC is undertaking wastewater monitoring in a wide radius surrounding farms where cattle have tested positive.

Subsidy The costs of the tracking system are partly reimbursed by USDA; the costs of the disinfection and PPE are fully reimbursed by USDA; the testing and disposal costs are fully reimbursed by the USDA. The subsidy (*to*) together with the costs of wastewater surveillance are assumed to be \$612m. Providing an estimate of the subsidy amount for a hypothetical worst-case scenario is speculative. We set the subsidy at approximately twice the amount provided to each sector in Scenario 2.

Supplementary 3 Economic shocks

We model the H5N1 outbreak in dairy cattle in the US, the reaction of domestic and export demand, and the corresponding mandated government containment measures, as four exogenous shocks impacting the whole economy at equilibrium (see Table 2 of main text). We distinguish four types of shocks:

- 1) A demand shock affecting consumption through demanded quantities (*qpa*) of raw milk, dairy products, and beef meat (S2 and S3 only)²³.
- 2) A supply shock caused by reductions in productivity (*aoall* and *afeall*) associated with containment measures including on-site biosecurity, personal protection of workers, testing requirements, restrictions on moving cattle within and across states, decline in milk, beef and cattle production along with death of infected cows²⁴.
- 3) An international trade shock caused by reduced export demand (*qxs*) for US milk, milk products, beef and cattle to other countries²³.
- 4) Subsidies (*to*) for dairy farmers from the US government to address financial losses from lost milk production, biosecurity measures, testing and veterinary expenses¹².

The magnitude of the shocks differ by scenario as discussed in Main text, Table 2.

Estimating the possible magnitude of the shocks across scenarios S1, S2 and S3 is clearly hypothetical. To ground our assumptions in some evidence, we consulted the extant literature that has estimated the impact of Bovine spongiform encephalopathy (BSE) in the 1980s and 90s, and the H1N1 pandemic in 2009 on the livestock sector in the US. While H5N1 is a different disease, we believe that these estimates provide a reasonable basis to formulate possible shocks of the current outbreak by some order-of-magnitude.

Supplementary 4 Results explanation

Our results show that macroeconomic variables are negatively affected by H5N1 in the USA, with the exception of traded quantities. Supplementary Table 4 shows aggregate effects on consumption, investment, price and quantity index of GDP, trade and welfare, by region and scenario. Supplementary Tables 5 to 9 show effects on output prices, trade, output quantities, employment of unskilled labour, and investment, disaggregated by sector, region and scenario (the values in Supplementary Tables 5 to 9 are also plotted in Figure 4 in the main text).

The current situation as modelled by scenario S1 results in a loss of real GDP of -0.06%. In a realistic (S2) and a reasonable worst case scenario (S3), with more extensive spread of the outbreak across the USA, stronger reductions in domestic and export demand and stepped up government interventions we found GDP losses of 0.28% and 0.91%, respectively.

At the sectoral level, the effects are more ambiguous. The supply-side shock, implemented through a productivity decrease, drives part of our results. This shock is a Hicks-neutral technical change, i.e. an exogenous reduction of productivity of both inputs that does not affect the quantities. It is transmitted through multiple channels, explaining part of the observed effects. Three effects arise from these supply shocks: modification of input requirement, input price, and cost of production. The US economy becomes less efficient in producing raw milk, dairy and meat products, and needs more labour to compensate for the lost productivity and maintain production in the shocked sectors. This leads to higher employment levels in these sectors. These effects increase production costs and prices, accelerating inflation impacting directly households. This means that the H5N1 outbreak results in an increase in prices, because the outbreak and the mitigation measures increase the costs of producing agricultural products. Prices, captured by the GDP price index, increase by 0.01%, 0.08% and 0.1% for the three scenarios. The subsidies are meant to compensate for at least part of the impacts. However, its positive impacts are small, indicating the insufficiency of the state-provided compensations to farmers (Supplementary Table 10).

This productivity shock increases the amount of unskilled labour required to maintain the same level of output. Since real wages are assumed to be fixed, the cost of employing additional workers does not rise, encouraging firms in these sectors to demand more labour to compensate for the productivity loss. However, the shock has also a negative impact on the rest of the economy's employment levels. The net employment effect depends on the strength of the Hicks-neutral shocks compared to other shocks on demand, for example. If the Hicks-neutral productivity shocks is larger than the demand shocks, employment increases and vice versa. This decrease in productivity has negative spillover effects on the labour market conditions (less than 1.44% in the worst-case scenario for "other sectors"), slightly affecting both US household incomes and consumption of all goods and services in the USA within reasonable estimates.

Our findings suggest that aggregating all these impacts, consumption of goods and services overall decreases by 0.05% in the current situation, and 0.21% and 0.86% in S2 and S3. Lowered household incomes also reduce saving capacity, resulting in a reduction in sectoral investments in the USA, which is strongest in the dairy industry. Overall, investments into all sectors decrease by 0.04%, 0.19% and 0.67% across the scenarios.

Demand shocks are implemented through reductions in demanded quantities for different goods, to capture a reduction in total demand and a preference shift. They affect the economy very differently from supply shocks. Here, demand shocks affect overall output, labour supply, and domestic demand, while investment, trade, and prices are hardly impacted by demand shocks (they are impacted by supply shocks as explained above). This phenomenon is due to the use of taxes as a swap variable, the mechanism by which final consumption is shocked in the GTAP model. Taxes effectively lower demanded quantities while maintaining market prices of the goods. As a result, the final consumption and labour input of the shocked sectors are mostly negatively affected, while trade and investment remain steady, as the demand shock does not directly alter the available income of the private consumers but only weakens domestic demand for the taxed sectors. Additionally, a reallocation of domestic consumption from agricultural goods to other goods occurs due to both supply and demand shocks.

The US's key trading partners in dairy products, meat and cattle (Canada and Mexico) are also impacted by the H5N1 outbreak, although we assume here that they do not experience a H5N1 outbreak in their own dairy and beef industries. We assume that some countries ban the import of US agricultural products, but even without these mandates, US dairy products and cattle are less competitive on the international market because of the price increase. Consequently, exports of agricultural products from the USA to other countries decrease, and US agricultural outputs decrease. On the other hand, the reduced terms of trade make the overall US economy more competitive internationally in non-agricultural goods and services, resulting in an increase of exports. This can compensate for the decrease in exports of agricultural products, resulting in an overall increase in US exports of 0.01% (S1), 0.11% (S2), and 0.75% (S3).

Trade shifts occur indirectly in S1 and directly in S2 and S3, where a percentage reduction of traded

quantities is implemented. Following the outbreak, the U.S. experiences an increase in the global export volume and value (this effect only weakly mitigates H5N1 negative impact on the US economy). This increase is driven by two main factors. First, the agricultural slowdown induces a reallocation of domestic factors from agricultural to non-agricultural sectors. This factor mobility results in a decrease in the price of US-manufactured goods, thereby rendering US manufacturing more competitive on global markets. Second, the reduction in US agricultural output necessitates an increase in imports to satisfy domestic demand. This shift benefits the agricultural sectors of US trading partners, leading to neutral or positive effects on their economies. These positive economic effects in partner countries create a feedback into US trade, as the increased income in trading partners stimulates demand for imported goods. Indeed, unlike in the US, consumption and investments in Canada and Mexico increase, although the effect is small and never larger than 1%. At the sectoral level, we observe large distortions in agricultural sectors. For example, increases of 7.67%, 35.33%, and 165.06% in dairy exported quantities from Canada, for the three scenarios respectively. These large movements are explained by the small quantity of dairy exported by Canada before the outbreak, as most production was aimed at meeting domestic demand. Therefore, any large increase in export quantity can translate into high percentage changes, even if the absolute quantity remains small relative to the size of the sector. This is evident when looking at the corresponding changes in output quantities, which increase by only 0.65%, 1.29%, and 6.16%.

For the key trading partners, this boost in economic activity and income increases their consumers' demand for non-agricultural imported goods, benefiting in turn US manufacturing sectors. In GTAP, the Armington elasticities play an important role in this phenomenon by representing the substitution rate between imported and domestic goods. For example, as a consequence of H5N1, Americans substitute dairy, meats, raw milk, and cattle with Canadian equivalents, while Canada and other nations raise their demand for U.S.-manufactured goods. The latter effect overcompensates for the increased agricultural exports to the US, therefore the net effect on exports from trading partners to the US is on average negative. The impacts on trading partners are small, and therefore hardly measurable in GDP terms.

The welfare of US households decreases, measurable in dollar terms. In the current situation S1, welfare decreases by \$11,657 million. For the other two scenarios, welfare loss amounts to \$53,656 million (S2) and \$179,317.66 million (S3). The welfare results can be understood as the payment that would be required to compensate households for the aggregate welfare loss they experience due to the shocks implemented in each scenario. In GTAP, welfare is decomposed into four main drivers: 1) allocative efficiency; 2) technical efficiency; 3) terms of trade; 4) saving/investment change. Our shocks affect each component, but not in the same magnitude. Indeed, the productivity shocks, driven by technical efficiency, represent a substantial portion of the welfare decrease for households while the other shocks are having much smaller effects. In contrast to the US, welfare of households in the trading countries increases, with the largest positive impacts for Canada and Mexico but also regions of Oceania and Latin America.

Supplementary Table 4: Aggregate economic impacts of H5N1 for the USA and trading partners for three scenarios

Region	S1: Current Situation	S2: Realistic Scenario	S3: Worst Case Scenario	Variable
USA	-0.05%	-0.21%	-0.86%	Consumption
	-0.04%	-0.19%	-0.67%	Investment
	0.01%	0.08%	0.1%	Price of Gross Domestic Product
	-0.06%	-0.28%	-0.91%	Quantity Gross Domestic Product
	0.01%	0.11%	0.75%	Trade
	-11657.43*	-53656.05*	-179317.66*	Welfare
Oceania	0.04%	0.13%	0.73%	Consumption
	0.02%	0.07%	0.32%	Investment
	0.03%	0.11%	0.63%	Price of Gross Domestic Product
	0.00%	0.01%	0.07%	Quantity Gross Domestic Product
	-0.01%	0.00%	0.03%	Trade
	156.34*	521.16*	3177.32*	Welfare
Canada	0.02%	0.07%	0.39%	Consumption
	0.02%	0.08%	0.38%	Investment
	0.01%	0.05%	0.28%	Price of Gross Domestic Product
	0.00%	0.01%	0.08%	Quantity Gross Domestic Product
	-0.02%	-0.04%	-0.23%	Trade
	51.47*	240.82*	2099.86*	Welfare
Mexico	0.02%	0.03%	0.34%	Consumption
	0.01%	0.03%	0.2%	Investment
	0.02%	0.03%	0.31%	Price of Gross Domestic Product
	0.00%	0%	0%	Quantity Gross Domestic Product
	-0.06%	-0.07%	-0.53%	Trade
	-40.74*	-290.79*	235.31*	Welfare
East Asia	0.00%	0.01%	0.05%	Consumption
	0.00%	0.01%	0.04%	Investment
	0.01%	0.01%	0.08%	Price of Gross Domestic Product
	0%	-0.01%	-0.04%	Quantity Gross Domestic Product
	-0.02%	-0.04%	-0.21%	Trade
	-739.38*	-2900.73*	-9672.61*	Welfare
Latin America	0.02%	0.05%	0.23%	Consumption
	0.01%	0.05%	0.21%	Investment
	0.01%	0.04%	0.21%	Price of Gross Domestic Product
	0.00%	0.00%	0.01%	Quantity Gross Domestic Product
	-0.01%	-0.02%	-0.12%	Trade
	69.19*	151.97*	1523.1*	Welfare
Western Europe	0.01%	0.02%	0.1%	Consumption
	0.01%	0.04%	0.14%	Investment
	0.01%	0.02%	0.1%	Price of Gross Domestic Product
	0.00%	0.00%	0.00%	Quantity Gross Domestic Product
	0.00%	-0.02%	-0.07%	Trade
	32.89*	44.05*	836.9*	Welfare

Region	S1: Current Situation	S2: Realistic Scenario	S3: Worst Case Scenario	Variable
Other Asia	0.01%	0.02%	0.1%	Consumption
	0.00%	0.01%	0.05%	Investment
	0.03%	0.02%	0.1%	Price of Gross Domestic Product
	0.00%	0.00%	-0.01%	Quantity Gross Domestic Product
	-0.01%	-0.04%	-0.12%	Trade
	-91.02*	-404.13*	-1095.86*	Welfare
Africa and Middle East	0.01%	0.02%	0.1%	Consumption
	0.01%	0.02%	0.09%	Investment
	0.01%	0.02%	0.1%	Price of Gross Domestic Product
	0.00%	0.00%	0.00%	Quantity Gross Domestic Product
	-0.01%	-0.02%	-0.07%	Trade
	-28.13*	-183.54*	-350.42*	Welfare
Rest of the World	0.01%	0.05%	0.1%	Consumption
	0.01%	0.03%	0.11%	Investment
	0.01%	0.02%	0.09%	Price of Gross Domestic Product
	0.00%	0.00%	0.00%	Quantity Gross Domestic Product
	0.00%	-0.02%	-0.07%	Trade
	2.26*	5.79*	62.60*	Welfare

Note: **Consumption (YP)** represents the spending by regional households on goods and services. It is influenced by factors such as income, prices, and preferences; **Investment (QINV)** refers to the aggregate volume of investment; **Price of Gross Domestic Product (PGDP)** is a measure used to evaluate the price level of all final goods and services produced within a country or region. This variable helps in comparing price levels across different regions and time periods within the model; **Quantity index of Gross Domestic Product (QGDP)** measures the real output of an economy, adjusted for inflation, and reflects the percentage change in the GDP quantity index. This variable is crucial for analysing economic growth and comparing the real economic performance of different regions within the model; **Trade (QXWREG)** captures the percentage change in real export volume by one country. This variable is essential for assessing international trade performance, evaluating the global demand for local products and competitiveness on the global markets within the model. ***Welfare (EV)** captures the direct payment in millions of US \$ to households that would be needed to compensate for the welfare losses imposed by the scenarios.

Supplementary Table 5: Potential impact on output prices, by scenario, sector, and region, % evolution compared to pre-H5N1 situation

<i>Output Prices (po)</i>	Sector	Oceania	East Asia	Other Asia	Canada	Mexico	US	Latin America	Western Europe	Africa and Middle East	Rest of the World
S1	Grains and Crops	0.1	0.02	0.02	0.03	0.11	0.07	0.03	0.03	0.02	0.01
	Dairy	0.1	0.03	0.02	0.04	0.13	5.25	0.03	0.02	0.01	0.01
	Meats	0.07	0.02	0.02	0.07	0.17	1.5	0.04	0.02	0.01	0.01
	Cattle	0.16	0.04	0.03	0.06	0.27	3.29	0.05	0.04	0.02	0.01
	Raw Milk	0.18	0.03	0.03	0.04	0.3	5.58	0.05	0.05	0.02	0.01
	Other Meat	0.06	0.02	0.01	0.02	0.05	0.04	0.02	0.02	0.01	0.01
	Processed Food	0.04	0.01	0.01	0.02	0.03	0.11	0.02	0.01	0.01	0.01
	Manufacture	0.03	0.01	0.01	0.01	0.01	-0.01	0.01	0.01	0.01	0.01
	Other Sectors	0.03	0.01	0.01	0.01	0.02	-0.02	0.01	0.01	0.01	0.01
S2	Grains and Crops	0.32	0.08	0.08	0.14	0.55	0.51	0.13	0.10	0.07	0.06
	Dairy	0.26	0.05	0.05	0.11	0.26	22.38	0.07	0.06	0.04	0.03
	Meats	0.26	0.06	0.07	0.29	0.81	13.90	0.12	0.06	0.03	0.04
	Cattle	0.58	0.10	0.09	0.31	1.44	15.45	0.17	0.13	0.07	0.05
	Raw Milk	0.45	0.07	0.08	0.18	0.79	19.38	0.15	0.15	0.07	0.05
	Other Meat	0.19	0.05	0.05	0.10	0.22	0.29	0.08	0.05	0.04	0.04
	Processed Food	0.13	0.04	0.04	0.10	0.10	0.58	0.06	0.03	0.04	0.03
	Manufacture	0.09	0.02	0.02	0.03	0.02	-0.03	0.03	0.02	0.02	0.02
	Other Sectors	0.10	0.02	0.02	0.05	0.03	-0.04	0.04	0.02	0.02	0.02
S3	Grains and Crops	1.72	0.32	0.32	0.62	2.11	1.62	0.54	0.42	0.29	0.23
	Dairy	1.4	0.24	0.22	0.49	1.23	82.96	0.34	0.25	0.16	0.13
	Meats	1.48	0.3	0.33	1.34	3.26	52.11	0.58	0.26	0.16	0.17
	Cattle	3.38	0.48	0.43	1.37	5.66	36.12	0.82	0.54	0.28	0.23
	Raw Milk	2.4	0.31	0.34	0.8	3.45	111.51	0.67	0.69	0.29	0.22
	Other Meat	1	0.22	0.19	0.43	0.92	0.88	0.37	0.23	0.16	0.16
	Processed Food	0.69	0.18	0.18	0.41	0.47	2.14	0.26	0.15	0.15	0.11
	Manufacture	0.47	0.08	0.08	0.14	0.11	-0.2	0.16	0.09	0.08	0.08
	Other Sectors	0.53	0.07	0.08	0.25	0.21	-0.24	0.18	0.09	0.08	0.08

Note: **po** is the cost of production of non-saving commodity output supplied by industries in a specific region.

Supplementary Table 6: Potential impact on trade, by scenario, sector, and region, % evolution compared to pre-H5N1 situation

<i>Trade (qxw)</i>	Sector	Oceania	East Asia	Other Asia	Canada	Mexico	US	Latin Amer- ica	Western Eu- rope	Africa and Mid- dle East	Rest of the World
S1	Grains and Crops	-0.29	0.05	0.05	0.06	-0.28	-0.12	0.02	0.02	0.06	0.06
	Dairy	2.17	2.63	2.18	7.67	8.31	-25.30	3.43	0.94	0.67	0.27
	Meats	1.89	0.95	0.42	3.55	3.19	-7.97	1.15	0.22	0.43	0.22
	Cattle	0.29	1.39	0.22	4.92	4.38	-8.55	0.42	0.70	0.17	0.25
	Raw Milk	0.12	1.32	2.52	6.78	7.66	-31.79	4.37	1.27	2.43	2.03
	Other Meat	-0.21	0.05	0.05	0.00	-0.21	-0.07	-0.01	0.01	0.04	0.04
	Processed Food	-0.05	0.03	0.03	0.02	0.00	-0.24	0.02	0.02	0.02	0.03
	Manufacture	-0.15	-0.02	-0.02	-0.05	-0.07	0.10	-0.06	-0.01	-0.01	-0.01
	Other Sectors	-0.14	-0.01	-0.01	-0.07	-0.09	0.12	-0.05	-0.02	-0.01	-0.01
S2	Grains and Crops	-0.74	0.35	0.36	0.28	-1.01	-1.31	0.29	0.13	0.32	0.28
	Dairy	3.56	4.43	3.48	35.33	37.06	-15.00	6.48	2.84	1.18	0.58
	Meats	9.66	4.11	0.78	26.19	27.37	-15.00	3.44	0.51	1.20	0.71
	Cattle	0.50	4.53	0.65	31.45	28.32	-15.00	1.60	3.03	0.48	0.77
	Raw Milk	1.19	4.48	9.09	24.76	30.12	-75.00	16.17	4.49	8.73	7.19
	Other Meat	-0.60	0.29	0.29	0.04	-0.74	-0.92	0.08	0.08	0.20	0.19
	Processed Food	-0.10	0.17	0.17	0.18	0.19	-1.37	0.13	0.11	0.08	0.11
	Manufacture	-0.52	-0.06	-0.06	-0.26	-0.19	0.28	-0.19	-0.05	-0.04	-0.04
	Other Sectors	-0.48	-0.02	-0.03	-0.31	-0.18	0.34	-0.16	-0.05	-0.03	-0.03
S3	Grains and Crops	-4.76	1.25	1.3	0.61	-4.31	-3.53	0.76	0.44	1.2	1.05
	Dairy	15.94	22.17	17.49	165.06	166.32	-75	32.17	13.73	5.88	2.83
	Meats	56.63	25.45	4.36	161.18	157.6	-75	21.24	3.01	6.91	4.14
	Cattle	1.46	21.6	3.55	66.74	45.77	-75	5.29	9.55	2.14	3.11
	Raw Milk	26.24	56.09	130.13	382.11	451.33	-90	241.52	64.31	125.58	100.92
	Other Meat	-3.71	1.05	1.09	-0.18	-3.32	-2.19	0	0.3	0.76	0.74
	Processed Food	-0.86	0.68	0.67	0.59	0.52	-4.83	0.46	0.46	0.33	0.44
	Manufacture	-2.82	-0.27	-0.26	-1.19	-1.01	1.54	-0.91	-0.21	-0.17	-0.17
	Other Sectors	-2.62	-0.09	-0.11	-1.48	-1.2	1.86	-0.76	-0.21	-0.13	-0.14

Note: **qxw** are the exported quantities from a specific region.

Supplementary Table 7: Potential impact on output quantities, by scenario, sector, and region, % evolution compared to pre-H5N1 situation

<i>Output quantities (qo)</i>	Sector	Oceania	East Asia	Other Asia	Canada	Mexico	US	Latin America	Western Europe	Africa and Middle East	Rest of the World
S1	Grains and Crops	-0.15	0.01	0.01	0.13	-0.12	-0.01	0.01	0.01	0.01	0.02
	Dairy	1.35	0.19	0.16	0.65	1.69	-3.4	0.26	0.27	0.1	0.03
	Meats	0.92	0.21	0.1	1.05	0.59	-1.68	0.18	0.05	0.02	0.01
	Cattle	0.75	0.14	0.05	1.68	0.91	-1.4	0.15	0.16	0.02	0.01
	Raw Milk	1.12	0.09	0.04	0.52	1.27	-1.06	0.16	0.17	0.04	0.02
	Other Meat	-0.08	0	0	0.01	-0.03	-0.07	0	0.01	0	0
	Processed Food	-0.01	0	0.01	0.06	0.02	-0.06	0.01	0.01	0	0.01
	Manufacture	-0.08	-0.01	-0.01	-0.04	-0.06	0.03	-0.02	-0.01	-0.01	0
	Other Sectors	-0.01	0	0	0	-0.01	-0.03	0	0	0	0
S2	Grains and Crops	-0.37	0.06	0.05	0.7	-0.37	-0.28	0.13	0.08	0.06	0.09
	Dairy	2.08	0.13	0.13	1.29	1.88	-9.32	0.3	0.8	0.12	0.06
	Meats	4.71	0.43	0.17	6.25	3.41	-5.47	0.5	0.11	0.04	0.03
	Cattle	3.54	0.25	0.10	9.92	5.35	0.19	0.43	0.56	0.03	0.03
	Raw Milk	1.71	0.06	0.02	1.1	1.58	0.01	0.19	0.5	0.05	0.03
	Other Meat	-0.19	0	0.01	0.07	-0.10	-0.42	0.02	0.03	0.01	0.02
	Processed Food	0	0.01	0.03	0.31	0.09	-0.26	0.04	0.06	0.01	0.03
	Manufacture	-0.26	-0.03	-0.03	-0.18	-0.15	0.04	-0.06	-0.03	-0.02	-0.02
	Other Sectors	-0.04	-0.01	-0.01	-0.01	-0.03	-0.13	-0.01	0	-0.01	0
S3	Grains and Crops	-2.48	0.2	0.17	2.4	-1.79	-0.74	0.38	0.3	0.23	0.35
	Dairy	9.32	0.69	0.69	6.16	9.01	-20.6	1.54	3.86	0.61	0.3
	Meats	27.62	2.3	0.96	37.9	19.16	-28.83	3.09	0.64	0.22	0.15
	Cattle	20.5	1.36	0.56	40.67	19.83	-8.03	2.56	2.01	0.19	0.17
	Raw Milk	7.68	0.33	0.16	5.28	7.79	-3.77	0.99	2.42	0.32	0.19
	Other Meat	-1.26	0.01	0.04	0.09	-0.41	-1.32	0.07	0.11	0.04	0.08
	Processed Food	-0.15	0.05	0.14	1.23	0.36	-0.74	0.17	0.25	0.05	0.11
	Manufacture	-1.45	-0.12	-0.15	-0.89	-0.81	0.43	-0.3	-0.14	-0.08	-0.07
	Other Sectors	-0.19	-0.03	-0.02	-0.03	-0.09	-0.42	-0.03	-0.01	-0.02	-0.01

Note: **qo** is the quantity of non-saving commodity output supplied by industries in a specific region.

Supplementary Table 8: Potential impact on employment of unskilled labour, by scenario, sector, and region, % evolution compared to pre-H5N1 situation

<i>Unskilled Sector labour (qes)</i>		Oceania	East Asia	Other Asia	Canada	Mexico	US	Latin America	Western Europe	Africa and Middle East	Rest of the World
S1	Grains and Crops	-0.11	0.01	0.01	0.14	-0.09	0.02	0.02	0.02	0.02	0.02
	Dairy	1.36	0.19	0.16	0.65	1.68	-0.71	0.26	0.27	0.09	0.03
	Meats	0.92	0.21	0.09	1.05	0.58	-1.4	0.18	0.05	0.02	0.01
	Cattle	0.82	0.15	0.05	1.7	1.01	1.21	0.17	0.18	0.02	0.02
	Raw Milk	1.19	0.1	0.04	0.54	1.39	5.16	0.18	0.19	0.05	0.02
	Other Meat	-0.05	0	0	0.01	-0.01	-0.06	0.01	0.01	0	0.01
	Processed Food	0	0	0	0.06	0	-0.11	0.01	0.01	0	0.01
	Manufacture	-0.07	-0.01	-0.02	-0.04	-0.07	-0.03	-0.02	-0.01	-0.01	0
	Other Sectors	-0.01	-0.01	-0.01	0	-0.03	-0.1	0	0	0	0
S2	Grains and Crops	-0.24	0.08	0.06	0.77	-0.19	-0.02	0.17	0.12	0.08	0.10
	Dairy	2.09	0.11	0.11	1.29	1.83	1.91	0.30	0.79	0.11	0.06
	Meats	4.72	0.42	0.15	6.25	3.36	1.02	0.50	0.10	0.03	0.02
	Cattle	3.83	0.28	0.12	10.07	5.91	12.16	0.48	0.62	0.05	0.05
	Raw Milk	1.89	0.08	0.04	1.16	1.88	23.54	0.24	0.55	0.07	0.04
	Other Meat	-0.12	0.02	0.02	0.10	-0.00	-0.31	0.05	0.05	0.02	0.03
	Processed Food	0.01	-0.00	0.02	0.31	0.05	-0.50	0.04	0.06	0.00	0.02
	Manufacture	-0.25	-0.04	-0.05	-0.18	-0.19	-0.21	-0.07	-0.04	-0.03	-0.02
	Other Sectors	-0.02	-0.03	-0.03	-0.01	-0.08	-0.45	-0.02	-0.01	-0.02	-0.01
S3	Grains and Crops	-1.8	0.28	0.24	2.68	-1.12	0.12	0.54	0.45	0.29	0.41
	Dairy	9.41	0.64	0.62	6.2	8.87	1.33	1.52	3.85	0.58	0.29
	Meats	27.71	2.25	0.89	37.94	19.01	-8.46	3.07	0.63	0.19	0.13
	Cattle	22.45	1.53	0.66	41.51	22.26	16.77	2.81	2.25	0.25	0.23
	Raw Milk	8.67	0.41	0.22	5.58	9.16	118	1.19	2.67	0.38	0.24
	Other Meat	-0.88	0.07	0.07	0.21	-0.04	-0.96	0.19	0.21	0.07	0.13
	Processed Food	-0.07	-0.01	0.08	1.27	0.23	-1.49	0.14	0.24	0.02	0.09
	Manufacture	-1.36	-0.19	-0.22	-0.85	-0.92	-0.37	-0.33	-0.15	-0.12	-0.08
	Other Sectors	-0.09	-0.1	-0.1	0.01	-0.25	-1.44	-0.05	-0.02	-0.06	-0.03

Note: **qes** for unskilled labour is the change of quantity of unskilled factor supply to a specific activity in a region

Supplementary Table 9: Potential impact on investment, by scenario, sector, and region, % evolution compared to pre-H5N1 situation

<i>Investment</i>	<i>Sector</i>	Oceania	East Asia	Other Asia	Canada	Mexico	US	Latin America	Western Europe	Africa and Middle East	Rest of the World
<i>(qid)</i>											
S1	Grains and Crops	0.02	0.01	0.01	0.02	-0.01	-0.04	0.01	0.01	0.01	0.01
	Dairy	0.62	0.5	0.1	0.04	3.97	-4.76	0.02	0.02	0.18	0.04
	Meats	0.05	0.94	0.09	0.03	1.14	-1.57	0.02	0.05	0.08	0.05
	Cattle	0.02	0.02	0.03	0.03	2.45	-0.07	0.03	0.03	0.01	0.01
	Raw Milk	0.02	0	0	0.02	0.01	-0.05	0.01	0.01	0.01	0.01
	Other Meat	0.01	0	0	0.02	-0.01	-0.04	0.01	0.01	0.01	0.01
	Processed Food	0.01	0.01	0	0.02	0.04	-0.09	0.01	0.01	0.01	0.01
	Manufacture	-0.04	0	0	-0.01	-0.01	-0.01	0	0.01	0	0.01
	Other Sectors	0.02	0	0	0.02	0.01	-0.04	0.01	0.01	0.01	0.01
S2	Grains and Crops	0.06	0.05	0.03	0.11	-0.01	-0.23	0.06	0.05	0.05	0.04
	Dairy	0.32	0.36	0.08	0.09	3.11	-20.05	0.05	0.04	0.18	0.06
	Meats	0.11	1.84	0.17	0.10	3.55	-14.53	0.05	0.12	0.18	0.14
	Cattle	0.08	0.04	0.09	0.11	6.87	-0.31	0.07	0.06	0.03	0.04
	Raw Milk	0.07	0.01	0.02	0.08	0.03	-0.23	0.05	0.04	0.02	0.03
	Other Meat	0.06	0.02	0.02	0.09	0.08	-0.20	0.05	0.04	0.04	0.03
	Processed Food	0.05	0.04	0.02	0.08	0.24	-0.45	0.05	0.05	0.03	0.04
	Manufacture	-0.13	0.01	0.01	-0.03	-0.03	-0.10	0.00	0.03	0.02	0.02
	Other Sectors	0.06	0.01	0.01	0.07	0.03	-0.18	0.05	0.04	0.02	0.03
S3	Grains and Crops	0.3	0.15	0.12	0.46	-0.1	-0.77	0.24	0.19	0.18	0.14
	Dairy	1.61	1.89	0.39	0.44	16.31	-60.91	0.23	0.17	0.9	0.29
	Meats	0.53	9.98	0.87	0.48	17.82	-47.56	0.22	0.59	0.92	0.66
	Cattle	0.37	0.2	0.52	0.56	37.22	-0.95	0.33	0.28	0.16	0.15
	Raw Milk	0.32	0.04	0.06	0.38	0.2	-1.1	0.21	0.14	0.09	0.11
	Other Meat	0.24	0.05	0.08	0.42	0.01	-0.71	0.21	0.15	0.14	0.13
	Processed Food	0.21	0.14	0.08	0.39	0.89	-1.63	0.22	0.19	0.13	0.15
	Manufacture	-0.78	0.02	0.02	-0.23	-0.2	-0.23	-0.02	0.11	0.06	0.09
	Other Sectors	0.31	0.04	0.05	0.37	0.2	-0.65	0.2	0.14	0.09	0.11

Note: **qid** is the quantity of investment in a specific region and sectors.

Supplementary Table 10: Output loss of dairy, cattle, meat and raw milk sectors, million \$, and % of loss covered by the current USDA subsidy of \$98 million, Scenario 1 (current situation)

Sector	Output pre-epidemic (qo)	Output post-epidemic (qo)	Lost output	Subsidy (\$ mil)	% of loss covered by subsidy
Dairy	136,429	131,796	4,633	55.4	1.2
Cattle	64,570	63,667	903	26.2	2.9
Meat	130,114	127,923	2,191	0.0	0.0
Raw Milk	40,204	39,778	426	16.3	3.8
Total	371,316	363,164	8,152	98.0	1.2

Note: Shown are the output pre- and post-epidemic, and the output loss by sector; values in all columns except the last in US\$ million; assumes subsidy is allocated across sectors according to the size of each sector in the GTAP model

Supplementary 5 Sensitivity analysis

We conduct a full sensitivity analysis on our shocks and elasticities separately, as commonly done in this literature. We follow the procedure discussed in the GTAP literature²⁵. This procedure is following three steps:

- We specify the interval within which each shock value is varied: $\pm 25\%$ around the baseline value. Each shock is varied independently to simulate its individual impact on the results following a triangular distribution.
- The shocks sensitivity analyses (SSA) use a Gaussian quadrature methods, specifically Stroud's and Liu's quadratures of order three, to approximate continuous distributions²⁵. These quadratures preserve the first three moments of the distribution (mean, variance, and third-order interactions), ensuring that the mean and standard deviation of shocks are captured. Stroud's quadrature generates $2N$ scenarios, and Liu's up to $4N$, where N is the number of independently varying, symmetric inputs. These methods allow efficient and reliable estimation of the effects of uncertainty in input parameters on GTAP outcomes.
- The outputs of the SSA are the mean values and standard deviations of the model variables, which are extracted for analysis. Assuming a normal distribution, we define uncertainty intervals as ± 2 standard deviations around the mean, capturing approximately 95% of the potential range of each outcome.

Supplementary 5.1 Shocks sensitivity analysis

The results of the SSA are presented in tables 11 to 23 for key macro-economic and sector-specific variables. Overall, our initial findings are robust to variations in the magnitude of shocks. The main exception is the raw milk sector, whose relatively small size makes it particularly sensitive to the assumptions used in the analysis. The other sectors show little sensitivity to variations in shocks across our scenarios.

Supplementary Table 11: Shocks sensitivity analysis for regional impacts across different macroeconomic variables

Variable	Region	S1	S2	S3
QGDP	Oceania	0.00 [-0.00–0.00]	0.01 [-0.00–0.01]	0.07 [0.05–0.09]
	East Asia	0.00 [-0.00–0.00]	-0.01 [-0.01–0.00]	-0.04 [-0.04–0.04]
	Other Asia	0.00 [-0.00–0.00]	0.00 [-0.00–0.00]	-0.01 [-0.01–0.01]
	Canada	0.00 [-0.00–0.00]	0.01 [-0.00–0.04]	0.08 [0.06–0.10]
	Mexico	0.00 [-0.00–0.00]	0.00 [-0.00–0.00]	0.00 [0.00–0.00]
	US	-0.06 [-0.06 - -0.06]	-0.28 [-0.30–0.26]	-0.92 [-1.06–0.78]
	Latin America	0.00 [0.00–0.00]	0.00 [-0.00–0.00]	0.01 [0.01–0.01]
	Western Europe	0.00 [0.00–0.00]	0.00 [-0.00–0.00]	0.00 [0.00–0.00]
	Africa and Middle East	0.00 [0.00–0.00]	0.00 [-0.00–0.00]	0.00 [0.00–0.00]
	Rest of the World	0.00 [0.00–0.00]	0.00 [0.00–0.00]	0.00 [0.00–0.00]
PGDP	Oceania	0.03 [0.03–0.03]	0.11 [0.10–0.12]	0.64 [0.54–0.74]
	East Asia	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.08 [0.06–0.10]
	Other Asia	0.01 [0.01–0.01]	0.02 [0.02–0.02]	0.11 [0.09–0.13]
	Canada	0.01 [0.01–0.01]	0.05 [0.05–0.05]	0.29 [0.25–0.33]
	Mexico	0.02 [0.02–0.03]	0.03 [0.03–0.03]	0.31 [0.25–0.37]
	US	0.01 [0.01–0.01]	0.08 [0.07–0.09]	0.10 [0.06–0.14]
	Latin America	0.01 [0.01–0.01]	0.04 [0.04–0.04]	0.21 [0.17–0.25]
	Western Europe	0.01 [0.01–0.01]	0.02 [0.02–0.02]	0.10 [0.08–0.12]
	Africa and Middle East	0.01 [0.01–0.01]	0.02 [0.02–0.02]	0.10 [0.08–0.12]
	Rest of the World	0.01 [0.01–0.01]	0.02 [0.02–0.02]	0.09 [0.07–0.11]
Welfare	Oceania	156.37 [136.31–176.43]	522.46 [467.92–577]	3223.53 [2706.85–3740.21]
	East Asia	-739.35 [-835.43–643.27]	-2906.69 [-3324.55–2488.83]	-9822.96 [-11779.90–7866.02]
	Other Asia	-91.00 [-101.10–80.90]	-405.02 [-464.22–345.82]	-1114.97 [-1374.95–855.00]
	Canada	51.51 [36.79–66.23]	241.91 [185.61–298.21]	2132.94 [1683.96–2581.92]
	Mexico	-40.72 [-47.64–33.80]	-291.13 [-345.75–236.51]	237.23 [35.43–439.03]
	US	-11661.02 [-13100.8–10221.22]	-53752.17 [-59204.81–48300.53]	-181122.22 [-208749.58–153494.86]
	Latin America	69.22 [58.32–80.12]	152.47 [130.11–174.83]	1552.02 [1288.60–1815.44]
	Western Europe	32.93 [21.81–44.05]	44.49 [-25.49–114.47]	842.62 [570.88–1114.36]
	Africa and Middle East	-28.13 [-31.47–24.79]	-184 [-219.80- -148.20]	-359.20 [-508.18–210.22]
	Rest of the World	2.26 [1.92–2.60]	5.8 [3.48–8.12]	63.27 [51.19–75.35]

Variable	Region	S1	S2	S3
Investment	Oceania	0.02 [0.02–0.02]	0.07 [0.07–0.07]	0.32 [0.28–0.36]
	East Asia	0.00 [0.00–0.00]	0.01 [0.01–0.01]	0.04 [0.02–0.06]
	Other Asia	0.00 [0.00–0.00]	0.01 [0.01–0.01]	0.05 [0.05–0.05]
	Canada	0.02 [0.02–0.02]	0.08 [0.08–0.08]	0.39 [0.33–0.45]
	Mexico	0.01 [0.01–0.01]	0.03 [0.03–0.03]	0.20 [0.16–0.24]
	US	-0.04 [-0.04– -0.04]	-0.19 [-0.21– -0.17]	-0.68 [-0.78– -0.58]
	Latin America	0.01 [0.01–0.01]	0.05 [0.05–0.05]	0.21 [0.17–0.25]
	Western Europe	0.01 [0.01–0.01]	0.04 [0.04–0.04]	0.15 [0.13–0.17]
	Africa and Middle East	0.01 [0.01–0.01]	0.02 [0.02–0.02]	0.09 [0.07–0.11]
	Rest of the World	0.01 [0.01–0.01]	0.03 [0.03–0.03]	0.11 [0.09–0.13]
Consumption	Oceania	0.04 [0.04–0.04]	0.13 [0.11–0.15]	0.74 [0.62–0.86]
	East Asia	0.00 [0.00–0.00]	0.01 [0.01–0.01]	0.05 [0.05–0.05]
	Other Asia	0.01 [0.01–0.01]	0.02 [0.02–0.02]	0.10 [0.08–0.12]
	Canada	0.02 [0.02–0.02]	0.07 [0.07–0.07]	0.40 [0.34–0.46]
	Mexico	0.02 [0.02–0.02]	0.03 [0.03–0.03]	0.35 [0.29–0.41]
	US	-0.05 [-0.05– -0.05]	-0.21 [-0.23– -0.19]	-0.87 [-1.05– -0.69]
	Latin America	0.02 [0.02–0.02]	0.05 [0.05–0.05]	0.24 [0.20–0.28]
	Western Europe	0.01 [0.01–0.01]	0.02 [0.02–0.02]	0.11 [0.09–0.13]
	Africa and Middle East	0.01 [0.01–0.01]	0.02 [0.02–0.02]	0.10 [0.08–0.12]
	Rest of the World	0.01 [0.01–0.01]	0.02 [0.02–0.02]	0.10 [0.08–0.12]
Trade	Oceania	-0.01 [-0.01– -0.01]	-0.00 [-0.00– -0.00]	-0.03 [-0.03– -0.03]
	East Asia	-0.02 [-0.02– -0.02]	-0.04 [-0.04– -0.04]	-0.21 [-0.23– -0.19]
	Other Asia	-0.01 [-0.01– -0.01]	-0.03 [-0.03– -0.03]	-0.12 [-0.14– -0.10]
	Canada	-0.02 [-0.02– -0.02]	-0.03 [-0.03– -0.03]	-0.23 [-0.25– -0.21]
	Mexico	-0.06 [-0.06– -0.06]	-0.07 [-0.09– -0.05]	-0.53 [-0.61– -0.45]
	US	0.01 [0.01–0.01]	0.11 [0.09–0.13]	0.77 [0.59–0.95]
	Latin America	-0.01 [-0.01– -0.01]	-0.02 [-0.02– -0.02]	-0.12 [-0.14– -0.10]
	Western Europe	0.00 [0.00–0.00]	-0.02 [-0.02– -0.02]	-0.07 [-0.09– -0.05]
	Africa and Middle East	-0.01 [-0.01– -0.01]	-0.02 [-0.02– -0.02]	-0.08 [-0.10– -0.06]
	Rest of the World	0.00 [0.00–0.00]	-0.02 [-0.02– -0.02]	-0.07 [-0.07– -0.07]

Note: Sensitivity analysis of regional macroeconomic results with (mean [min–max]). Min and max are derived using two standard deviation around the mean. **Consumption (YP)** represents the spending by regional households on goods and services. It is influenced by factors such as income, prices, and preferences; **Investment (QINV)** refers to the aggregate volume of investment; **Price of Gross Domestic Product (PGDP)** is a measure used to evaluate the price level of all final goods and services produced within a country or region. This variable helps in comparing the price levels across different regions and time periods within the model; **Quantity index of Gross Domestic Product (QGDP)** measures the real output of an economy, adjusted for inflation, and reflects the percentage change in the GDP quantity index. This variable is crucial for analysing economic growth and comparing the real economic performance of different regions within the model; **Trade (QXWREG)** captures the percentage change in real export volume by one country. This variable is essential for assessing international trade performance, evaluating the global demand for the local products and competitiveness in the global market within the model. **Welfare (EV)** captures a direct payment in millions of US \$ to households to compensate for welfare loss imposed by the scenarios.

Supplementary Table 12: Potential impact on output prices with shocks sensitivity analysis, by scenario, sector, and region, % evolution compared to pre-H5N1 situation

<i>Output Prices (po)</i>	Sector	Oceania	East Asia	Other Asia	Canada	Mexico	US	Latin America	Western Europe	Africa and Middle East	Rest of the World
S1	Grains and Crops	0.10 [0.08–0.12]	0.02 [0.02–0.02]	0.02 [0.02–0.02]	0.03 [0.03–0.03]	0.11 [0.09–0.13]	0.07 [0.05–0.09]	0.03 [0.03–0.03]	0.03 [0.03–0.03]	0.02 [0.02–0.02]	0.01 [0.01–0.01]
	Dairy	0.10 [0.08–0.12]	0.03 [0.03–0.03]	0.02 [0.02–0.02]	0.04 [0.04–0.04]	0.13 [0.11–0.15]	5.25 [4.43–6.07]	0.03 [0.03–0.03]	0.02 [0.02–0.02]	0.01 [0.01–0.01]	0.01 [0.01–0.01]
	Meats	0.07 [0.07–0.07]	0.02 [0.02–0.02]	0.02 [0.02–0.02]	0.07 [0.05–0.09]	0.17 [0.15–0.19]	1.50 [1.20–1.80]	0.04 [0.04–0.04]	0.02 [0.02–0.02]	0.01 [0.01–0.01]	0.01 [0.01–0.01]
	Cattle	0.16 [0.14–0.18]	0.04 [0.04–0.04]	0.03 [0.03–0.03]	0.06 [0.04–0.08]	0.27 [0.23–0.31]	3.29 [2.61–3.97]	0.05 [0.05–0.05]	0.04 [0.04–0.04]	0.02 [0.02–0.02]	0.01 [0.01–0.01]
	Raw Milk	0.18 [0.16–0.20]	0.03 [0.03–0.03]	0.03 [0.03–0.03]	0.04 [0.04–0.04]	0.30 [0.26–0.34]	5.58 [4.40–6.76]	0.05 [0.05–0.05]	0.05 [0.05–0.05]	0.02 [0.02–0.02]	0.01 [0.01–0.01]
	Other Meat	0.06 [0.06–0.06]	0.02 [0.02–0.02]	0.01 [0.01–0.01]	0.02 [0.02–0.02]	0.05 [0.05–0.05]	0.04 [0.04–0.04]	0.02 [0.02–0.02]	0.02 [0.02–0.02]	0.01 [0.01–0.01]	0.01 [0.01–0.01]
	Processed Food	0.04 [0.04–0.04]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.02 [0.02–0.02]	0.03 [0.03–0.03]	0.11 [0.09–0.13]	0.02 [0.02–0.02]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.01 [0.01–0.01]
	Manufacture	0.03 [0.03–0.03]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	-0.01 [-0.01– -0.01]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.01 [0.01–0.01]
	Other Sectors	0.03 [0.03–0.03]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.02 [0.02–0.02]	-0.02 [-0.02– -0.02]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.01 [0.01–0.01]
	Grains and Crops	0.32 [0.28–0.36]	0.08 [0.06–0.10]	0.08 [0.06–0.10]	0.14 [0.12–0.16]	0.55 [0.47–0.63]	0.52 [0.40–0.64]	0.13 [0.11–0.15]	0.10 [0.08–0.12]	0.07 [0.07–0.07]	0.06 [0.06–0.06]
	Dairy	0.26 [0.24–0.28]	0.05 [0.05–0.05]	0.05 [0.05–0.05]	0.11 [0.09–0.13]	0.26 [0.22–0.30]	22.43 [18.33–26.53]	0.07 [0.07–0.07]	0.06 [0.06–0.06]	0.04 [0.04–0.04]	0.03 [0.03–0.03]
S2	Meats	0.26 [0.24–0.28]	0.06 [0.06–0.06]	0.07 [0.07–0.07]	0.29 [0.25–0.33]	0.81 [0.69–0.93]	13.91 [11.69–16.13]	0.12 [0.10–0.14]	0.06 [0.06–0.06]	0.03 [0.03–0.03]	0.04 [0.04–0.04]
	Cattle	0.58 [0.52–0.64]	0.11 [0.09–0.13]	0.09 [0.07–0.11]	0.31 [0.27–0.35]	1.44 [1.22–1.66]	15.48 [11.90–19.06]	0.17 [0.15–0.19]	0.13 [0.11–0.15]	0.07 [0.07–0.07]	0.05 [0.05–0.05]
	Raw Milk	0.45 [0.41–0.49]	0.07 [0.07–0.07]	0.08 [0.08–0.08]	0.18 [0.16–0.20]	0.79 [0.69–0.89]	19.42 [14.88–23.96]	0.15 [0.13–0.17]	0.15 [0.13–0.17]	0.07 [0.07–0.07]	0.05 [0.05–0.05]
	Other Meat	0.19 [0.17–0.21]	0.05 [0.05–0.05]	0.05 [0.05–0.05]	0.10 [0.08–0.12]	0.22 [0.18–0.26]	0.29 [0.23–0.35]	0.08 [0.06–0.10]	0.06 [0.06–0.06]	0.04 [0.04–0.04]	0.04 [0.04–0.04]
	Processed Food	0.13 [0.11–0.15]	0.04 [0.04–0.04]	0.04 [0.04–0.04]	0.10 [0.08–0.12]	0.10 [0.08–0.12]	0.58 [0.50–0.66]	0.06 [0.06–0.06]	0.03 [0.03–0.03]	0.04 [0.04–0.04]	0.03 [0.03–0.03]
	Manufacture	0.09 [0.09–0.09]	0.02 [0.02–0.02]	0.02 [0.02–0.02]	0.03 [0.03–0.03]	0.02 [0.02–0.02]	-0.03 [-0.03– -0.03]	0.03 [0.03–0.03]	0.02 [0.02–0.02]	0.02 [0.02–0.02]	0.02 [0.02–0.02]
	Other Sectors	0.10 [0.10–0.10]	0.02 [0.02–0.02]	0.02 [0.02–0.02]	0.05 [0.05–0.05]	0.03 [0.03–0.03]	-0.04 [-0.04– -0.04]	0.04 [0.04–0.04]	0.02 [0.02–0.02]	0.02 [0.02–0.02]	0.02 [0.02–0.02]
	Grains and Crops	1.75 [1.47–2.03]	0.33 [0.27–0.39]	0.32 [0.24–0.40]	0.63 [0.51–0.75]	2.15 [1.73–2.57]	1.66 [0.90–2.42]	0.55 [0.43–0.67]	0.43 [0.33–0.53]	0.29 [0.23–0.35]	0.23 [0.17–0.29]
	Dairy	1.42 [1.18–1.66]	0.25 [0.21–0.29]	0.23 [0.19–0.27]	0.49 [0.41–0.57]	1.24 [1.06–1.42]	84.25 [60.31– 108.19]	0.35 [0.29–0.41]	0.26 [0.20–0.32]	0.16 [0.14–0.18]	0.13 [0.11–0.15]
	Meats	1.51 [1.27–1.75]	0.30 [0.26–0.34]	0.33 [0.29–0.37]	1.36 [1.18–1.54]	3.30 [2.78–3.82]	52.37 [41.27–63.47]	0.59 [0.51–0.67]	0.27 [0.23–0.31]	0.16 [0.14–0.18]	0.17 [0.15–0.19]
	Cattle	3.43 [2.85–4.01]	0.49 [0.41–0.57]	0.44 [0.36–0.52]	1.39 [1.13–1.65]	5.72 [4.78–6.66]	36.37 [26.45–46.29]	0.83 [0.71–0.95]	0.55 [0.45–0.65]	0.29 [0.23–0.35]	0.23 [0.19–0.27]
	Raw Milk	2.44 [2.02–2.86]	0.32 [0.26–0.38]	0.35 [0.27–0.43]	0.81 [0.65–0.97]	3.49 [2.93–4.05]	114.17 [66.25–162.09]	0.68 [0.54–0.82]	0.70 [0.52–0.88]	0.30 [0.24–0.36]	0.22 [0.18–0.26]
S3	Other Meat	1.01 [0.85–1.17]	0.22 [0.18–0.26]	0.20 [0.16–0.24]	0.44 [0.34–0.54]	0.93 [0.77–1.09]	0.90 [0.54–1.26]	0.38 [0.30–0.46]	0.24 [0.20–0.28]	0.17 [0.13–0.21]	0.16 [0.12–0.20]
	Processed Food	0.70 [0.60–0.80]	0.18 [0.14–0.22]	0.18 [0.14–0.22]	0.42 [0.34–0.50]	0.47 [0.39–0.55]	2.17 [1.65–2.69]	0.27 [0.23–0.31]	0.15 [0.13–0.17]	0.15 [0.13–0.17]	0.11 [0.09–0.13]
	Manufacture	0.48 [0.40–0.56]	0.08 [0.06–0.10]	0.08 [0.06–0.10]	0.15 [0.13–0.17]	0.11 [0.09–0.13]	-0.21 [-0.25– -0.17]	0.16 [0.14–0.18]	0.09 [0.07–0.11]	0.08 [0.06–0.10]	0.08 [0.06–0.10]
	Other Sectors	0.54 [0.46–0.62]	0.08 [0.08–0.08]	0.08 [0.06–0.10]	0.25 [0.21–0.29]	0.21 [0.17–0.25]	-0.25 [-0.29– -0.21]	0.18 [0.16–0.20]	0.09 [0.07–0.11]	0.08 [0.06–0.10]	0.08 [0.06–0.10]

Note: **po** is the cost of production of non-saving commodity output supplied by industries in a specific region. Values are expressed as mean [min–max] percentage changes from pre-H5N1 conditions.

Supplementary Table 13: Potential impact on traded quantities with shocks sensitivity analysis, by scenario, sector, and region, % evolution compared to pre-H5N1 situation

<i>Trade (qxw)</i>	Sector	Oceania	East Asia	Other Asia	Canada	Mexico	US	Latin America	Western Europe	Africa and Middle East	Rest of the World
S1	Grains and Crops	-0.29 [-0.33–0.25]	0.05 [0.05–0.05]	0.05 [0.05–0.05]	0.06 [0.06–0.06]	-0.28 [-0.32–0.24]	-0.12 [-0.14–0.10]	0.02 [0.02–0.02]	0.02 [0.02–0.02]	0.06 [0.06–0.06]	0.06 [0.06–0.06]
	Dairy	2.17 [1.83–2.51]	2.63 [2.25–3.01]	2.18 [1.88–2.48]	7.68 [6.42–8.94]	8.32 [6.96–9.68]	-25.29 [-28.67–21.91]	3.43 [2.93–3.93]	0.94 [0.80–1.08]	0.67 [0.57–0.77]	0.27 [0.23–0.31]
	Meats	1.89 [1.49–2.29]	0.95 [0.77–1.13]	0.42 [0.34–0.50]	3.55 [2.85–4.25]	3.19 [2.53–3.85]	-7.97 [-9.49–6.45]	1.15 [0.93–1.37]	0.22 [0.18–0.26]	0.43 [0.35–0.51]	0.22 [0.18–0.26]
	Cattle	0.29 [0.21–0.37]	1.39 [1.13–1.65]	0.22 [0.18–0.26]	4.92 [3.86–5.98]	4.39 [3.41–5.37]	-8.54 [-10.26–6.82]	0.42 [0.34–0.50]	0.70 [0.56–0.84]	0.17 [0.13–0.21]	0.25 [0.21–0.29]
	Raw Milk	0.12 [-0.08–0.32]	1.32 [1.06–1.58]	2.52 [1.98–3.06]	6.79 [5.29–8.29]	7.67 [5.65–9.69]	-31.74 [-37.18–26.30]	4.37 [3.41–5.33]	1.27 [0.99–1.55]	2.43 [1.93–2.93]	2.03 [1.61–2.45]
	Other Meat	-0.21 [-0.23–0.19]	0.05 [0.05–0.05]	0.05 [0.05–0.05]	0.00 [0.00–0.00]	-0.21 [-0.23–0.19]	-0.07 [-0.09–0.05]	-0.01 [-0.01–0.01]	0.01 [0.01–0.01]	0.04 [0.04–0.04]	0.04 [0.04–0.04]
	Processed Food	-0.05 [-0.05–0.05]	0.03 [0.03–0.03]	0.03 [0.03–0.03]	0.02 [0.02–0.02]	0.00 [0.00–0.00]	-0.24 [-0.28–0.20]	0.02 [0.02–0.02]	0.02 [0.02–0.02]	0.02 [0.02–0.02]	0.03 [0.03–0.03]
	Manufacture	-0.15 [-0.17–0.13]	-0.02 [-0.02–0.02]	-0.02 [-0.02–0.02]	-0.05 [-0.05–0.05]	-0.07 [-0.07–0.07]	0.10 [0.08–0.12]	-0.06 [-0.06–0.06]	-0.01 [-0.01–0.01]	-0.01 [-0.01–0.01]	-0.01 [-0.01–0.01]
	Other Sectors	-0.14 [-0.16–0.12]	-0.01 [-0.01–0.01]	-0.01 [-0.01–0.01]	-0.07 [-0.09–0.05]	-0.09 [-0.11–0.07]	0.12 [0.10–0.14]	-0.05 [-0.06–0.04]	-0.02 [-0.02–0.02]	-0.01 [-0.01–0.01]	-0.01 [-0.01–0.01]
S2	Grains and Crops	-0.75 [-0.83–0.67]	0.35 [0.27–0.43]	0.36 [0.28–0.44]	0.28 [0.20–0.36]	-1.01 [-1.15–0.87]	-1.31 [-1.67–0.95]	0.29 [0.21–0.37]	0.13 [0.09–0.17]	0.32 [0.26–0.38]	0.28 [0.24–0.32]
	Dairy	3.57 [2.99–4.15]	4.45 [3.85–5.05]	3.49 [3.03–3.95]	35.52 [29.12–41.92]	37.26 [30.44–44.08]	-15.00 [-16.34–13.66]	6.51 [5.57–7.45]	2.85 [2.39–3.31]	1.19 [1.03–1.35]	0.58 [0.50–0.66]
	Meats	9.68 [8.44–10.92]	4.12 [3.64–4.60]	0.78 [0.70–0.86]	26.24 [22.50–29.98]	27.42 [23.36–31.48]	-15.00 [-16.98–13.02]	3.45 [3.09–3.81]	0.51 [0.45–0.57]	1.20 [1.10–1.30]	0.71 [0.63–0.79]
	Cattle	0.50 [0.40–0.60]	4.54 [3.94–5.14]	0.65 [0.59–0.71]	31.55 [23.63–39.47]	28.39 [20.97–35.81]	-15.00 [-16.34–13.66]	1.60 [1.30–1.90]	3.04 [2.42–3.66]	0.48 [0.42–0.54]	0.78 [0.68–0.88]
	Raw Milk	1.20 [0.58–1.82]	4.51 [3.67–5.35]	9.15 [7.19–11.11]	24.92 [18.96–30.88]	30.32 [22.12–38.52]	-75.01 [-81.53–68.49]	16.27 [12.53–20.01]	4.52 [3.52–5.52]	8.78 [6.88–10.68]	7.23 [5.71–8.75]
	Other Meat	-0.60 [-0.66–0.54]	0.29 [0.23–0.35]	0.29 [0.25–0.33]	0.04 [0.00–0.08]	-0.74 [-0.86–0.62]	-0.93 [-1.17–0.69]	0.08 [0.06–0.10]	0.08 [0.06–0.10]	0.20 [0.16–0.24]	0.19 [0.15–0.23]
	Processed Food	-0.10 [-0.12–0.08]	0.17 [0.15–0.19]	0.17 [0.15–0.19]	0.18 [0.10–0.26]	0.19 [0.11–0.27]	-1.38 [-1.58–1.18]	0.13 [0.11–0.15]	0.11 [0.09–0.13]	0.08 [0.06–0.10]	0.11 [0.09–0.13]
	Manufacture	-0.52 [-0.58–0.46]	-0.06 [-0.06–0.06]	-0.06 [-0.06–0.06]	-0.26 [-0.30–0.22]	-0.19 [-0.21–0.17]	0.28 [0.26–0.30]	-0.19 [-0.21–0.17]	-0.05 [-0.05–0.05]	-0.04 [-0.04–0.04]	-0.04 [-0.04–0.04]
	Other Sectors	-0.48 [-0.52–0.44]	-0.02 [-0.02–0.02]	-0.03 [-0.03–0.03]	-0.31 [-0.35–0.27]	-0.18 [-0.20–0.16]	0.34 [0.30–0.38]	-0.16 [-0.18–0.14]	-0.05 [-0.05–0.05]	-0.03 [-0.03–0.03]	-0.03 [-0.03–0.03]
S3	Grains and Crops	-4.83 [-5.61–4.05]	1.28 [0.82–1.74]	1.33 [0.89–1.77]	0.64 [-0.06–1.34]	-4.33 [-5.09–3.57]	-3.64 [-5.78–1.50]	0.79 [0.33–1.25]	0.45 [0.29–0.61]	1.22 [0.84–1.60]	1.08 [0.76–1.40]
	Dairy	16.15 [11.01–21.29]	22.43 [16.77–28.09]	17.69 [13.43–21.95]	167.53 [107.67–227.39]	169.32 [108.24–230.40]	-75.01 [-81.73–68.29]	32.56 [23.74–41.38]	13.91 [9.51–18.31]	5.95 [4.49–7.41]	2.87 [2.09–3.65]
	Meats	57.23 [46.59–67.87]	25.78 [20.96–30.60]	4.39 [3.87–4.91]	163.36 [128.02–198.70]	159.39 [124.25–194.53]	-75.01 [-84.89–65.13]	21.44 [18.20–24.68]	3.03 [2.63–3.43]	6.98 [6.02–7.94]	4.19 [3.57–4.81]
	Cattle	1.45 [0.85–2.05]	21.86 [18.70–25.02]	3.59 [3.15–4.03]	67.47 [41.21–93.73]	46.16 [24.50–67.82]	-75.02 [-81.70–68.34]	5.35 [4.27–6.43]	9.66 [7.46–11.86]	2.16 [1.86–2.46]	3.14 [2.68–3.60]
	Raw Milk	29.27 [6.15–52.39]	60.97 [25.11–96.83]	141.44 [57.12–225.76]	415.58 [163.98–667.18]	490.98 [188.44–793.52]	-84.72 [-112.14–57.30]	262.59 [104.51–420.67]	69.86 [28.28–111.44]	136.47 [55.17–217.77]	109.64 [44.66–174.62]
	Other Meat	-3.76 [-4.36–3.16]	1.08 [0.76–1.40]	1.11 [0.81–1.41]	-0.18 [-0.46–0.10]	-3.36 [-3.86–2.86]	-2.25 [-3.59–0.91]	0.00 [-0.18–0.18]	0.31 [0.23–0.39]	0.78 [0.56–1.00]	0.76 [0.56–0.96]
	Processed Food	-0.87 [-1.09–0.65]	0.69 [0.51–0.87]	0.68 [0.52–0.84]	0.59 [0.27–0.91]	0.53 [0.19–0.87]	-4.89 [-6.11–3.67]	0.47 [0.33–0.61]	0.34 [0.34–0.58]	0.45 [0.26–0.42]	0.45 [0.35–0.55]
	Manufacture	-2.86 [-3.30–2.42]	-0.27 [-0.31–0.23]	-0.27 [-0.33–0.21]	-1.21 [-1.41–1.01]	-1.02 [-1.16–0.88]	1.56 [1.28–1.84]	-0.92 [-1.08–0.76]	-0.22 [-0.28–0.16]	-0.18 [-0.22–0.14]	-0.17 [-0.21–0.13]
	Other Sectors	-2.66 [-3.06–2.26]	-0.09 [-0.11–0.07]	-0.11 [-0.13–0.09]	-1.50 [-1.74–1.26]	-1.21 [-1.39–1.03]	1.89 [1.59–2.19]	-0.77 [-0.91–0.63]	-0.21 [-0.25–0.17]	-0.13 [-0.15–0.11]	-0.14 [-0.16–0.12]

Note: **qxw** is the exported quantities from a specific region. Values are expressed as mean [min–max] percentage changes from pre-H5N1 conditions.

Supplementary Table 14: Potential impact on output quantities with shocks sensitivity analysis, by scenario, sector, and region, % evolution compared to pre-H5N1 situation

<i>Output Quantities (qo)</i>	Sector	Oceania	East Asia	Other Asia	Canada	Mexico	US	Latin America	Western Europe	Africa and Middle East	Rest of the World
S1	Grains and Crops	-0.15 [-0.17–0.13]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.13 [0.11–0.15]	-0.12 [-0.14–0.10]	-0.01 [-0.01–0.01]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.02 [0.02–0.02]
	Dairy	1.35 [1.15–1.55]	0.19 [0.17–0.21]	0.16 [0.14–0.18]	0.65 [0.55–0.75]	1.69 [1.45–1.93]	-3.40 [-3.88–2.92]	0.26 [0.22–0.30]	0.27 [0.23–0.31]	0.10 [0.08–0.12]	0.03 [0.03–0.03]
	Meats	0.92 [0.72–1.12]	0.21 [0.17–0.25]	0.10 [0.08–0.12]	1.05 [0.85–1.25]	0.59 [0.47–0.71]	-1.68 [-2.00–1.36]	0.18 [0.14–0.22]	0.05 [0.05–0.05]	0.02 [0.02–0.02]	0.01 [0.01–0.01]
	Cattle	0.75 [0.61–0.89]	0.14 [0.12–0.16]	0.05 [0.05–0.05]	1.68 [1.34–2.02]	0.91 [0.71–1.11]	-1.40 [-1.68–1.12]	0.15 [0.13–0.17]	0.16 [0.12–0.20]	0.02 [0.02–0.02]	0.01 [0.01–0.01]
	Raw Milk	1.12 [0.94–1.30]	0.09 [0.07–0.11]	0.04 [0.04–0.04]	0.52 [0.44–0.60]	1.27 [1.09–1.45]	-1.06 [-1.38–0.74]	0.16 [0.14–0.18]	0.17 [0.15–0.19]	0.04 [0.04–0.04]	0.02 [0.02–0.02]
	Other Meat	-0.08 [-0.08–0.08]	0.00 [0.00–0.00]	0.00 [0.00–0.00]	0.01 [0.01–0.01]	-0.03 [-0.03–0.03]	-0.07 [-0.07–0.07]	0.00 [0.00–0.00]	0.01 [0.01–0.01]	0.00 [0.00–0.00]	0.00 [0.00–0.00]
	Processed Food	-0.01 [-0.01–0.01]	0.00 [0.00–0.00]	0.01 [0.01–0.01]	0.06 [0.06–0.06]	0.02 [0.02–0.02]	-0.06 [-0.06–0.06]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.00 [0.00–0.00]	0.01 [0.01–0.01]
	Manufacture	-0.08 [-0.08–0.08]	-0.01 [-0.01–0.01]	-0.01 [-0.01–0.01]	-0.04 [-0.04–0.04]	-0.06 [-0.06–0.06]	0.03 [0.03–0.03]	-0.02 [-0.02–0.02]	-0.01 [-0.01–0.01]	-0.01 [-0.01–0.01]	0.00 [0.00–0.00]
	Other Sectors	-0.01 [-0.01–0.01]	0.00 [0.00–0.00]	0.00 [0.00–0.00]	0.00 [0.00–0.00]	-0.01 [-0.01–0.01]	-0.03 [-0.03–0.03]	0.00 [0.00–0.00]	0.00 [0.00–0.00]	0.00 [0.00–0.00]	0.00 [0.00–0.00]
S2	Grains and Crops	-0.37 [-0.41–0.33]	0.06 [0.04–0.08]	0.05 [0.05–0.05]	0.71 [0.57–0.85]	-0.37 [-0.43–0.31]	-0.28 [-0.36–0.20]	0.13 [0.09–0.17]	0.08 [0.06–0.10]	0.06 [0.04–0.08]	0.09 [0.07–0.11]
	Dairy	2.09 [1.75–2.43]	0.13 [0.11–0.15]	0.13 [0.11–0.15]	1.29 [1.11–1.47]	1.88 [1.60–2.16]	-9.33 [-11.61–7.05]	0.30 [0.26–0.34]	0.80 [0.68–0.92]	0.12 [0.10–0.14]	0.06 [0.06–0.06]
	Meats	4.72 [4.12–5.32]	0.43 [0.35–0.51]	0.17 [0.15–0.19]	6.26 [5.44–7.08]	3.41 [3.01–3.81]	-5.48 [-6.34–4.62]	0.50 [0.44–0.56]	0.11 [0.09–0.13]	0.04 [0.04–0.04]	0.03 [0.03–0.03]
	Cattle	3.55 [3.11–3.99]	0.25 [0.21–0.29]	0.10 [0.10–0.10]	9.95 [8.25–11.65]	5.36 [4.52–6.20]	0.19 [-1.05–1.43]	0.43 [0.39–0.47]	0.56 [0.46–0.66]	0.03 [0.03–0.03]	0.03 [0.03–0.03]
	Raw Milk	1.72 [1.44–2.00]	0.06 [0.06–0.06]	0.02 [0.02–0.02]	1.10 [0.96–1.24]	1.58 [1.38–1.78]	0.02 [-3.14–3.18]	0.19 [0.17–0.21]	0.50 [0.42–0.58]	0.05 [0.05–0.05]	0.03 [0.03–0.03]
	Other Meat	-0.20 [-0.22–0.18]	0.00 [0.00–0.00]	0.01 [0.01–0.01]	0.07 [0.05–0.09]	-0.10 [-0.12–0.08]	-0.42 [-0.48–0.36]	0.02 [0.02–0.02]	0.03 [0.03–0.03]	0.01 [0.01–0.01]	0.02 [0.02–0.02]
	Processed Food	0.00 [0.00–0.00]	0.01 [0.01–0.01]	0.03 [0.03–0.03]	0.31 [0.27–0.35]	0.09 [0.07–0.11]	-0.26 [-0.32–0.20]	0.04 [0.04–0.04]	0.06 [0.06–0.06]	0.01 [0.01–0.01]	0.03 [0.03–0.03]
	Manufacture	-0.26 [-0.28–0.24]	-0.03 [-0.03–0.03]	-0.03 [-0.03–0.03]	-0.18 [-0.20–0.16]	-0.15 [-0.17–0.13]	0.04 [0.04–0.04]	-0.06 [-0.06–0.06]	-0.03 [-0.03–0.03]	-0.02 [-0.02–0.02]	-0.02 [-0.02–0.02]
	Other Sectors	-0.04 [-0.04–0.04]	-0.01 [-0.01–0.01]	-0.01 [-0.01–0.01]	-0.01 [-0.01–0.01]	-0.03 [-0.03–0.03]	-0.13 [-0.15–0.11]	-0.01 [-0.01–0.01]	0.00 [0.00–0.00]	-0.01 [-0.01–0.01]	0.00 [0.00–0.00]
S3	Grains and Crops	-2.51 [-2.93–2.09]	0.20 [0.12–0.28]	0.17 [0.11–0.23]	2.44 [1.70–3.18]	-1.79 [-2.25–1.33]	-0.78 [-1.34–0.22]	0.39 [0.19–0.59]	0.31 [0.21–0.41]	0.23 [0.15–0.31]	0.35 [0.25–0.45]
	Dairy	9.44 [6.52–12.36]	0.70 [0.58–0.82]	0.69 [0.57–0.81]	6.23 [4.51–7.95]	9.13 [7.43–10.83]	-20.74 [-25.06–16.42]	1.56 [1.22–1.90]	3.91 [2.69–5.13]	0.62 [0.50–0.74]	0.30 [0.22–0.38]
	Meats	27.91 [22.73–33.09]	2.31 [1.91–2.71]	0.96 [0.82–1.10]	38.37 [30.69–46.05]	19.32 [16.00–22.64]	-28.91 [-33.77–24.05]	3.12 [2.66–3.58]	0.64 [0.54–0.74]	0.22 [0.20–0.24]	0.15 [0.13–0.17]
	Cattle	20.72 [17.02–24.42]	1.37 [1.15–1.59]	0.56 [0.50–0.62]	41.15 [33.31–48.99]	19.98 [16.76–23.20]	-8.05 [-14.31–1.79]	2.59 [2.23–2.95]	2.03 [1.67–2.39]	0.19 [0.17–0.21]	0.17 [0.15–0.19]
	Raw Milk	7.78 [5.36–10.20]	0.33 [0.27–0.39]	0.16 [0.12–0.20]	5.34 [3.96–6.72]	7.89 [6.65–9.13]	-3.86 [-10.32–2.60]	1.02 [0.80–1.24]	2.46 [1.70–3.22]	0.33 [0.25–0.41]	0.19 [0.13–0.25]
	Other Meat	-1.28 [-1.48–1.08]	0.01 [0.01–0.01]	0.04 [0.02–0.06]	0.09 [-0.07–0.25]	-0.41 [-0.47–0.35]	-1.35 [-1.79–0.91]	0.08 [0.06–0.10]	0.11 [0.07–0.15]	0.04 [0.02–0.06]	0.08 [0.06–0.10]
	Processed Food	-0.15 [-0.21–0.09]	0.05 [0.05–0.05]	0.14 [0.10–0.18]	1.24 [0.98–1.50]	0.36 [0.26–0.46]	-0.74 [-0.98–0.50]	0.17 [0.13–0.21]	0.26 [0.20–0.32]	0.05 [0.03–0.07]	0.11 [0.09–0.13]
	Manufacture	-1.47 [-1.69–1.25]	-0.13 [-0.15–0.11]	-0.15 [-0.17–0.13]	-0.90 [-1.06–0.74]	-0.81 [-0.93–0.69]	0.44 [0.34–0.54]	-0.30 [-0.36–0.24]	-0.15 [-0.19–0.11]	-0.08 [-0.10–0.06]	-0.07 [-0.09–0.05]
	Other Sectors	-0.19 [-0.21–0.17]	-0.03 [-0.03–0.03]	-0.02 [-0.02–0.02]	-0.03 [-0.03–0.03]	-0.09 [-0.11–0.07]	-0.42 [-0.48–0.36]	-0.03 [-0.03–0.03]	-0.01 [-0.01–0.01]	-0.02 [-0.02–0.02]	-0.01 [-0.01–0.01]

Note: **qo** is the quantities produced and supplied by industries in a specific region. Values are expressed as mean [min–max] percentage changes from pre-H5N1 conditions.

Supplementary Table 15: Potential impact on employment of unskilled labour with shocks sensitivity analysis, by scenario, sector, and region, % evolution compared to pre-H5N1 situation

<i>Unskilled labour (qes)</i>	Sector	Oceania	East Asia	Other Asia	Canada	Mexico	US	Latin America	Western Europe	Africa and Middle East	Rest of the World
S1	Grains and Crops	-0.11 [-0.13–0.09]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.14 [0.12–0.16]	-0.09 [-0.11–0.07]	0.02 [0.02–0.02]	0.02 [0.02–0.02]	0.02 [0.02–0.02]	0.02 [0.02–0.02]	0.02 [0.02–0.02]
	Dairy	1.36 [1.16–1.56]	0.19 [0.17–0.21]	0.16 [0.14–0.18]	0.65 [0.55–0.75]	1.68 [1.44–1.92]	-0.71 [-1.03–0.39]	0.26 [0.22–0.30]	0.27 [0.23–0.31]	0.09 [0.07–0.11]	0.03 [0.03–0.03]
	Meats	0.92 [0.72–1.12]	0.21 [0.17–0.25]	0.09 [0.07–0.11]	1.05 [0.85–1.25]	0.58 [0.46–0.70]	-1.40 [-1.72–1.08]	0.18 [0.14–0.22]	0.05 [0.05–0.05]	0.02 [0.02–0.02]	0.01 [0.01–0.01]
	Cattle	0.82 [0.66–0.98]	0.15 [0.13–0.17]	0.05 [0.05–0.05]	1.70 [1.36–2.04]	1.01 [0.79–1.23]	1.21 [1.07–1.35]	0.17 [0.15–0.19]	0.18 [0.16–0.20]	0.02 [0.02–0.02]	0.02 [0.02–0.02]
	Raw Milk	1.19 [1.01–1.37]	0.10 [0.08–0.12]	0.04 [0.04–0.04]	0.54 [0.46–0.62]	1.39 [1.19–1.59]	5.17 [4.31–6.03]	0.18 [0.16–0.20]	0.19 [0.17–0.21]	0.05 [0.05–0.05]	0.02 [0.02–0.02]
	Other Meat	-0.05 [-0.05–0.05]	0.00 [0.00–0.00]	0.00 [0.00–0.00]	0.01 [0.01–0.01]	-0.01 [-0.01–0.01]	-0.06 [-0.06–0.06]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.00 [0.00–0.00]	0.01 [0.01–0.01]
	Processed Food	0.00 [0.00–0.00]	0.00 [0.00–0.00]	0.00 [0.00–0.00]	0.06 [0.06–0.06]	0.00 [0.00–0.00]	-0.11 [-0.13–0.09]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.00 [0.00–0.00]	0.01 [0.01–0.01]
	Manufacture	-0.07 [-0.07–0.07]	-0.01 [-0.01–0.01]	-0.02 [-0.02–0.02]	-0.04 [-0.05–0.03]	-0.07 [-0.07–0.07]	-0.03 [-0.03–0.03]	-0.02 [-0.02–0.02]	-0.01 [-0.01–0.01]	-0.01 [-0.01–0.01]	0.00 [0.00–0.00]
	Other Sectors	-0.01 [-0.01–0.01]	-0.01 [-0.01–0.01]	-0.01 [-0.01–0.01]	0.00 [0.00–0.00]	-0.03 [-0.03–0.03]	-0.10 [-0.12–0.08]	0.00 [0.00–0.00]	0.00 [0.00–0.00]	0.00 [0.00–0.00]	0.00 [0.00–0.00]
S2	Grains and Crops	-0.24 [-0.28–0.20]	0.08 [0.06–0.10]	0.06 [0.04–0.08]	0.77 [0.63–0.91]	-0.19 [-0.25–0.13]	-0.02 [-0.04–0.00]	0.17 [0.13–0.21]	0.12 [0.10–0.14]	0.08 [0.06–0.10]	0.10 [0.08–0.12]
	Dairy	2.10 [1.76–2.44]	0.11 [0.09–0.13]	0.11 [0.09–0.13]	1.29 [1.11–1.47]	1.84 [1.56–2.12]	1.92 [-1.86–5.70]	0.30 [0.26–0.34]	0.80 [0.68–0.92]	0.11 [0.09–0.13]	0.06 [0.06–0.06]
	Meats	4.73 [4.13–5.33]	0.42 [0.34–0.50]	0.15 [0.13–0.17]	6.26 [5.44–7.08]	3.37 [2.97–3.77]	1.02 [-0.46–2.50]	0.50 [0.44–0.56]	0.10 [0.08–0.12]	0.03 [0.03–0.03]	0.02 [0.02–0.02]
	Cattle	3.84 [3.38–4.30]	0.29 [0.25–0.33]	0.12 [0.10–0.14]	10.10 [8.38–11.82]	5.92 [4.98–6.86]	12.18 [9.12–15.24]	0.48 [0.44–0.52]	0.62 [0.52–0.72]	0.05 [0.05–0.05]	0.05 [0.05–0.05]
	Raw Milk	1.90 [1.60–2.20]	0.08 [0.06–0.10]	0.04 [0.04–0.04]	1.17 [1.01–1.33]	1.89 [1.67–2.11]	23.60 [17.34–29.86]	0.24 [0.22–0.26]	0.56 [0.48–0.64]	0.07 [0.07–0.07]	0.04 [0.04–0.04]
	Other Meat	-0.12 [-0.14–0.10]	0.02 [0.02–0.02]	0.02 [0.02–0.02]	0.10 [0.08–0.12]	0.00 [0.00–0.00]	-0.31 [-0.35–0.27]	0.05 [0.05–0.05]	0.05 [0.05–0.05]	0.02 [0.02–0.02]	0.03 [0.03–0.03]
	Processed Food	0.01 [0.01–0.01]	0.00 [0.00–0.00]	0.02 [0.02–0.02]	0.31 [0.27–0.35]	0.05 [0.03–0.07]	-0.50 [-0.58–0.42]	0.04 [0.04–0.04]	0.06 [0.06–0.06]	0.00 [0.00–0.00]	0.02 [0.02–0.02]
	Manufacture	-0.25 [-0.27–0.23]	-0.04 [-0.04–0.04]	-0.05 [-0.05–0.05]	-0.18 [-0.20–0.16]	-0.19 [-0.21–0.17]	-0.21 [-0.25–0.17]	-0.07 [-0.07–0.07]	-0.04 [-0.04–0.04]	-0.03 [-0.03–0.03]	-0.02 [-0.02–0.02]
	Other Sectors	-0.02 [-0.02–0.02]	-0.03 [-0.03–0.03]	-0.03 [-0.03–0.03]	-0.01 [-0.01–0.01]	-0.08 [-0.08–0.08]	-0.45 [-0.49–0.41]	-0.02 [-0.02–0.02]	-0.01 [-0.01–0.01]	-0.02 [-0.02–0.02]	-0.01 [-0.01–0.01]
S3	Grains and Crops	-1.82 [-2.18–1.46]	0.29 [0.19–0.39]	0.24 [0.16–0.32]	2.73 [1.93–3.53]	-1.12 [-1.62–0.62]	0.11 [-0.03–0.25]	0.55 [0.31–0.79]	0.46 [0.32–0.60]	0.30 [0.20–0.40]	0.41 [0.29–0.53]
	Dairy	9.52 [6.60–12.44]	0.64 [0.52–0.76]	0.63 [0.53–0.73]	6.28 [4.56–8.00]	8.98 [7.28–10.68]	1.22 [-6.56–8.99]	1.54 [1.20–1.88]	3.90 [2.68–5.12]	0.59 [0.47–0.71]	0.29 [0.21–0.37]
	Meats	28.01 [22.81–33.21]	2.26 [1.86–2.66]	0.89 [0.75–1.03]	38.42 [30.72–46.12]	19.16 [15.86–22.46]	-8.51 [-15.89–1.13]	3.10 [2.64–3.56]	0.63 [0.55–0.71]	0.19 [0.17–0.21]	0.13 [0.11–0.15]
	Cattle	22.70 [18.62–26.78]	1.54 [1.30–1.78]	0.66 [0.58–0.74]	42.01 [33.95–50.07]	22.44 [18.76–26.12]	16.87 [6.49–27.25]	2.84 [2.46–3.22]	2.27 [1.87–2.67]	0.25 [0.21–0.29]	0.23 [0.21–0.25]
	Raw Milk	8.79 [6.19–11.39]	0.42 [0.36–0.48]	0.23 [0.19–0.27]	5.65 [4.23–7.07]	9.29 [7.87–10.71]	120.28 [72.80–167.76]	1.22 [0.96–1.48]	2.71 [1.87–3.55]	0.39 [0.29–0.49]	0.25 [0.17–0.33]
	Other Meat	-0.89 [-1.05–0.73]	0.07 [0.05–0.09]	0.08 [0.06–0.10]	0.22 [0.02–0.42]	-0.04 [-0.12–0.04]	-0.97 [-1.15–0.79]	0.19 [0.13–0.25]	0.21 [0.15–0.27]	0.07 [0.05–0.09]	0.13 [0.09–0.17]
	Processed Food	-0.07 [-0.13–0.01]	-0.01 [-0.03–0.01]	0.08 [0.06–0.10]	1.28 [1.02–1.54]	0.24 [0.16–0.32]	-1.49 [-1.75–1.23]	0.15 [0.11–0.19]	0.25 [0.19–0.31]	0.02 [0.02–0.02]	0.09 [0.07–0.11]
	Manufacture	-1.38 [-1.60–1.16]	-0.19 [-0.23–0.15]	-0.22 [-0.26–0.18]	-0.86 [-1.00–0.72]	-0.93 [-1.05–0.81]	-0.37 [-0.43–0.31]	-0.33 [-0.39–0.27]	-0.16 [-0.20–0.12]	-0.12 [-0.14–0.10]	-0.09 [-0.11–0.07]
	Other Sectors	-0.09 [-0.11–0.07]	-0.10 [-0.12–0.08]	-0.10 [-0.12–0.08]	0.01 [-0.01–0.03]	-0.25 [-0.29–0.21]	-1.45 [-1.63–1.27]	-0.06 [-0.08–0.04]	-0.02 [-0.02–0.02]	-0.07 [-0.09–0.05]	-0.03 [-0.05–0.01]

Note: **qes** for unskilled labour is the change of quantity of unskilled factor supply to a specific activity in a region. Values are expressed as mean [min–max] percentage changes from pre-H5N1 conditions.

Supplementary Table 16: Potential impact on investment with shocks sensitivity analysis, by scenario, sector, and region, % evolution compared to pre-H5N1 situation

<i>Investment (qid)</i>	Sector	Oceania	East Asia	Other Asia	Canada	Mexico	US	Latin America	Western Europe	Africa and Middle East	Rest of the World
S1	Grains and Crops	0.02 [0.02–0.02]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.02 [0.02–0.02]	-0.01 [-0.01– -0.01]	-0.04 [-0.04– -0.04]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.01 [0.01–0.01]
	Dairy	0.62 [0.54–0.70]	0.50 [0.44–0.56]	0.10 [0.08–0.12]	0.04 [0.04–0.04]	3.97 [3.39–4.55]	-4.76 [-5.50– -4.02]	0.02 [0.02–0.02]	0.02 [0.02–0.02]	0.18 [0.16–0.20]	0.04 [0.04–0.04]
	Meats	0.05 [0.05–0.05]	0.94 [0.76–1.12]	0.09 [0.07–0.11]	0.03 [0.03–0.03]	1.14 [0.92–1.36]	-1.57 [-1.87– -1.27]	0.02 [0.02–0.02]	0.05 [0.05–0.05]	0.08 [0.06–0.10]	0.05 [0.05–0.05]
	Cattle	0.02 [0.02–0.02]	0.02 [0.02–0.02]	0.03 [0.03–0.03]	0.03 [0.03–0.03]	2.45 [1.93–2.97]	-0.07 [-0.07– -0.07]	0.03 [0.03–0.03]	0.03 [0.03–0.03]	0.01 [0.01–0.01]	0.01 [0.01–0.01]
	Raw Milk	0.02 [0.02–0.02]	0.00 [0.00–0.00]	0.00 [0.00–0.00]	0.02 [0.02–0.02]	0.01 [0.01–0.01]	-0.05 [-0.05– -0.05]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.01 [0.01–0.01]
	Other Meat	0.01 [0.01–0.01]	0.00 [0.00–0.00]	0.00 [0.00–0.00]	0.02 [0.02–0.02]	-0.01 [-0.01– -0.01]	-0.04 [-0.04– -0.04]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.01 [0.01–0.01]
	Processed Food	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.02 [0.02–0.02]	0.04 [0.04–0.04]	-0.09 [-0.11– -0.07]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.01 [0.01–0.01]
	Manufacture	-0.04 [-0.04– -0.04]	0.00 [0.00–0.00]	0.00 [0.00–0.00]	-0.01 [-0.01– -0.01]	-0.01 [-0.01– -0.01]	-0.01 [-0.01– -0.01]	0.00 [0.00–0.00]	0.01 [0.01–0.01]	0.00 [0.00–0.00]	0.01 [0.01–0.01]
	Other Sectors	0.02 [0.02–0.02]	0.00 [0.00–0.00]	0.00 [0.00–0.00]	0.02 [0.02–0.02]	0.01 [0.01–0.01]	-0.04 [-0.04– -0.04]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.01 [0.01–0.01]
	Grains and Crops	0.06 [0.06–0.06]	0.05 [0.05–0.05]	0.03 [0.03–0.03]	0.11 [0.09–0.13]	-0.01 [-0.03–0.01]	-0.23 [-0.25– -0.21]	0.06 [0.06–0.06]	0.05 [0.05–0.05]	0.05 [0.05–0.05]	0.04 [0.04–0.04]
	Dairy	0.32 [0.26–0.38]	0.36 [0.30–0.42]	0.08 [0.06–0.10]	0.09 [0.09–0.09]	3.11 [2.47–3.75]	-20.08 [-23.62– -16.54]	0.05 [0.05–0.05]	0.04 [0.04–0.04]	0.18 [0.16–0.20]	0.06 [0.06–0.06]
S2	Meats	0.11 [0.09–0.13]	1.84 [1.52–2.16]	0.17 [0.15–0.19]	0.10 [0.10–0.10]	3.55 [2.79–4.31]	-14.54 [-16.82– -12.26]	0.05 [0.05–0.05]	0.12 [0.10–0.14]	0.18 [0.16–0.20]	0.14 [0.12–0.16]
	Cattle	0.08 [0.08–0.08]	0.04 [0.04–0.04]	0.09 [0.09–0.09]	0.11 [0.09–0.13]	6.87 [5.37–8.37]	-0.31 [-0.35– -0.27]	0.07 [0.07–0.07]	0.06 [0.06–0.06]	0.03 [0.03–0.03]	0.04 [0.04–0.04]
	Raw Milk	0.07 [0.07–0.07]	0.01 [0.01–0.01]	0.02 [0.02–0.02]	0.08 [0.08–0.08]	0.03 [0.03–0.03]	-0.23 [-0.25– -0.21]	0.05 [0.05–0.05]	0.04 [0.04–0.04]	0.02 [0.02–0.02]	0.03 [0.03–0.03]
	Other Meat	0.06 [0.06–0.06]	0.02 [0.02–0.02]	0.02 [0.02–0.02]	0.09 [0.07–0.11]	0.08 [0.04–0.12]	-0.20 [-0.22– -0.18]	0.05 [0.05–0.05]	0.04 [0.04–0.04]	0.04 [0.04–0.04]	0.03 [0.03–0.03]
	Processed Food	0.05 [0.05–0.05]	0.04 [0.04–0.04]	0.02 [0.02–0.02]	0.08 [0.08–0.08]	0.24 [0.20–0.28]	-0.45 [-0.51– -0.39]	0.05 [0.05–0.05]	0.05 [0.05–0.05]	0.03 [0.03–0.03]	0.04 [0.04–0.04]
	Manufacture	-0.13 [-0.15– -0.11]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	-0.03 [-0.03– -0.03]	-0.03 [-0.03– -0.03]	-0.10 [-0.12– -0.08]	0.00 [0.00–0.00]	0.03 [0.03–0.03]	0.02 [0.02–0.02]	0.02 [0.02–0.02]
	Other Sectors	0.07 [0.07–0.07]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.07 [0.07–0.07]	0.03 [0.03–0.03]	-0.18 [-0.20– -0.16]	0.05 [0.05–0.05]	0.04 [0.04–0.04]	0.02 [0.02–0.02]	0.03 [0.03–0.03]
	Grains and Crops	0.30 [0.26–0.34]	0.16 [0.12–0.20]	0.13 [0.11–0.15]	0.47 [0.37–0.57]	-0.10 [-0.26–0.06]	-0.78 [-0.96– -0.60]	0.25 [0.21–0.29]	0.19 [0.15–0.23]	0.18 [0.14–0.22]	0.14 [0.12–0.16]
	Dairy	1.61 [1.21–2.01]	1.91 [1.59–2.23]	0.40 [0.34–0.46]	0.44 [0.38–0.50]	16.33 [12.83–19.83]	-61.11 [-72.43– -49.79]	0.23 [0.19–0.27]	0.17 [0.15–0.19]	0.91 [0.79–1.03]	0.29 [0.25–0.33]
	Meats	0.53 [0.47–0.59]	10.03 [8.05–12.01]	0.87 [0.73–1.01]	0.48 [0.42–0.54]	17.80 [14.20–21.40]	-47.60 [-55.52– -39.68]	0.22 [0.18–0.26]	0.59 [0.51–0.67]	0.93 [0.81–1.05]	0.67 [0.59–0.75]
S3	Cattle	0.37 [0.33–0.41]	0.20 [0.16–0.24]	0.53 [0.45–0.61]	0.57 [0.49–0.65]	37.33 [27.93–46.73]	-0.96 [-1.10– -0.82]	0.33 [0.29–0.37]	0.28 [0.24–0.32]	0.16 [0.14–0.18]	0.15 [0.13–0.17]
	Raw Milk	0.32 [0.28–0.36]	0.04 [0.02–0.06]	0.06 [0.06–0.06]	0.39 [0.33–0.45]	0.20 [0.16–0.24]	-1.13 [-1.49– -0.77]	0.21 [0.17–0.25]	0.15 [0.13–0.17]	0.09 [0.07–0.11]	0.11 [0.09–0.13]
	Other Meat	0.24 [0.20–0.28]	0.05 [0.03–0.07]	0.08 [0.06–0.10]	0.43 [0.35–0.51]	0.02 [-0.26–0.30]	-0.72 [-0.84– -0.60]	0.22 [0.18–0.26]	0.15 [0.13–0.17]	0.14 [0.12–0.16]	0.14 [0.12–0.16]
	Processed Food	0.21 [0.17–0.25]	0.15 [0.13–0.17]	0.08 [0.06–0.10]	0.40 [0.34–0.46]	0.90 [0.68–1.12]	-1.65 [-1.99– -1.31]	0.22 [0.18–0.26]	0.19 [0.15–0.23]	0.13 [0.11–0.15]	0.15 [0.13–0.17]
	Manufacture	-0.79 [-0.91– -0.67]	0.02 [0.02–0.02]	0.02 [0.02–0.02]	-0.23 [-0.27– -0.19]	-0.20 [-0.24– -0.16]	-0.23 [-0.27– -0.19]	-0.02 [-0.04–0.00]	0.11 [0.09–0.13]	0.06 [0.06–0.06]	0.10 [0.08–0.12]
	Other Sectors	0.32 [0.28–0.36]	0.04 [0.02–0.06]	0.05 [0.05–0.05]	0.38 [0.32–0.44]	0.20 [0.16–0.24]	-0.65 [-0.75– -0.55]	0.20 [0.16–0.24]	0.14 [0.12–0.16]	0.09 [0.07–0.11]	0.11 [0.09–0.13]

Note: **qid** is the quantity of investment in a specific activity in a region. Values are expressed as mean [min–max] percentage changes from pre-H5N1 conditions.

Supplementary Table 17: Output loss and subsidy coverage for S1 with 95% confidence intervals for shocks sensitivity analysis

Sector	Pre	Post	CI low	CI high	Loss	Loss (low)	Loss (high)	Subsidy	% Covered	% Covered (low)	% Covered (high)
Dairy	136,429	131,796	131,163	132,429	4,633	5,266	4,000	55.4	1.20	1.05	1.38
Cattle	64,570	63,667	63,489	63,845	903	1,081	725	26.2	2.90	2.42	3.62
Meat	130,114	127,923	127,514	128,332	2,191	2,600	1,782	0.0	0.00	0.00	0.00
Raw Milk	40,204	39,778	39,651	39,905	426	553	299	16.3	3.83	2.95	5.46
Total	371,316	361,816	361,816	364,512	8,153	9,501	6,805	98.0	1.20	1.03	1.44

Note: Confidence intervals are based on ± 2 standard deviations around the post-epidemic output. All values in million \$. Percentages refer to share of losses covered by the \$98 million USDA subsidy.

Supplementary 5.2 Parameters sensitivity analysis

In a second set of sensitivity analyses (SA), we adjust two key elasticities: SUBPAR, the price elasticity of demand for consumers, and ESUBD, the Armington elasticity. These two elasticities were selected because they play an important role in shaping the model's response to an H5N1 outbreak, and because the literature offers limited guidance on how these parameters might be affected by such a shock. SUBPAR captures how consumers react to changes in the price of specific goods, while ESUBD reflects how easily consumers can substitute domestic goods for foreign ones.

This sensitivity analysis enables us to obtain confidence intervals for our results, based on variations in the values of these parameters, as previously done for shocks. In this section, we focus on both the macroeconomic and sectoral results. We specifically conduct this SA on the four most affected sectors: Raw Milk, Cattle, Dairy, and Beef, and for Scenarios 2 and 3 only. We exclude Scenario 1 due to the limited availability and spread of public information regarding H5N1 under that scenario, as discussed in Supplementary 2.

According to Table 18, the impact of variations in the elasticities affect estimated impacts only in Scenario 3 at the macroeconomic level, and even then, the effect remains relatively limited. At the meso-economic level, we can observe that elasticity variations in Scenario 2 have a small impact, while in Scenario 3, they can have a medium impact.

Supplementary Table 18: Parameters sensitivity analysis for regional impacts across different macroeconomic variables

Variable	Region	S2	S3
QGDG	Oceania	0.01 [0.01–0.01]	0.07 [0.05–0.09]
	East Asia	-0.01 [-0.01–0.01]	-0.04 [-0.04–0.04]
	Other Asia	0.00 [0.00–0.00]	-0.01 [-0.01–0.01]
	Canada	0.01 [0.01–0.01]	0.08 [0.06–0.10]
	Mexico	0.00 [0.00–0.00]	0.00 [0.00–0.00]
	US	-0.28 [-0.28–0.28]	-0.91 [-0.93–0.89]
	Latin America	0.00 [0.00–0.00]	0.01 [0.01–0.01]
	West Europe	0.00 [0.00–0.00]	0.00 [0.00–0.00]
	Africa and Middle East	0.00 [0.00–0.00]	0.00 [0.00–0.00]
	Rest of the World	0.00 [0.00–0.00]	0.00 [0.00–0.00]
PGDG	Oceania	0.11 [0.09–0.13]	0.63 [0.51–0.75]
	East Asia	0.01 [0.01–0.01]	0.08 [0.08–0.08]
	Other Asia	0.02 [0.02–0.02]	0.10 [0.10–0.10]
	Canada	0.05 [0.05–0.05]	0.29 [0.23–0.35]
	Mexico	0.03 [0.03–0.03]	0.31 [0.27–0.35]
	US	0.08 [0.08–0.08]	0.10 [0.06–0.14]
	Latin America	0.04 [0.04–0.04]	0.21 [0.19–0.23]
	Western Europe	0.02 [0.02–0.02]	0.10 [0.08–0.12]
	Africa and Middle East	0.02 [0.02–0.02]	0.10 [0.10–0.10]
	Rest of the World	0.02 [0.02–0.02]	0.09 [0.09–0.09]
Welfare	Oceania	522.24 [435.36–609.12]	3195.32 [2513.46–3877.18]
	East Asia	-2900.78 [-2928.64–2872.92]	-9672.63 [-9884.13–9461.13]
	Other Asia	-404.12 [-408.42–399.82]	-1095.54 [-1131.34–1059.74]
	Canada	242.11 [153.05–331.17]	2120.62 [1510.20–2731.04]
	Mexico	-290.38 [-324.26–256.5]	241.18 [20.10–462.26]
	US	-53661.8 [-54039.59–53293.99]	-179318.06 [-180828.60–177807.52]
	Latin America	152.51 [122.87–182.15]	1536.21 [1312.77–1759.65]
	Western Europe	45.15 [-11.69–102]	835.45 [492.35–1178.55]
	Africa and Middle East	-183.45 [-189.91–176.99]	-348.92 [-402.52–295.32]
	Rest of the World	5.81 [4.13–7.49]	62.89 [51.15–74.63]

Variable	Region	S2	S3
Investment	Oceania	0.07 [0.07–0.07]	0.32 [0.28–0.36]
	East Asia	0.01 [0.01–0.01]	0.04 [0.04–0.04]
	Other Asia	0.01 [0.01–0.01]	0.05 [0.05–0.05]
	Canada	0.08 [0.08–0.08]	0.38 [0.32–0.44]
	Mexico	0.03 [0.03–0.03]	0.20 [0.18–0.22]
	US	-0.19 [-0.19–0.19]	-0.67 [-0.67–0.67]
	Latin America	0.05 [0.05–0.05]	0.21 [0.19–0.23]
	Western Europe	0.04 [0.04–0.04]	0.14 [0.14–0.14]
	Africa and Middle East	0.02 [0.02–0.02]	0.09 [0.09–0.09]
	Rest of the World	0.03 [0.03–0.03]	0.11 [0.11–0.11]
Consumption	Oceania	0.13 [0.11–0.15]	0.73 [0.59–0.87]
	East Asia	0.01 [0.01–0.01]	0.05 [0.05–0.05]
	Other Asia	0.02 [0.02–0.02]	0.10 [0.10–0.10]
	Canada	0.07 [0.05–0.09]	0.39 [0.31–0.47]
	Mexico	0.03 [0.04–0.04]	0.34 [0.28–0.40]
	US	-0.21 [-0.22–0.22]	-0.86 [-0.88–0.84]
	Latin America	0.05 [0.05–0.05]	0.23 [0.21–0.25]
	Western Europe	0.02 [0.02–0.02]	0.11 [0.09–0.13]
	Africa and Middle East	0.02 [0.02–0.02]	0.10 [0.10–0.10]
	Rest of the World	0.02 [0.02–0.02]	0.10 [0.10–0.10]
Trade	Oceania	-0.00[-0.01–0.01]	-0.03 [-0.05– -0.01]
	East Asia	-0.04 [-0.04–0.04]	-0.21 [-0.21– -0.21]
	Other Asia	-0.03 [-0.03–0.03]	-0.12 [-0.12– -0.12]
	Canada	-0.03 [-0.03–0.03]	-0.23 [-0.25– -0.21]
	Mexico	-0.07 [-0.07– -0.07]	-0.53 [-0.55– -0.51]
	US	0.11 [0.07–0.15]	0.76 [0.52–1.00]
	Latin America	-0.02 [-0.02–0.02]	-0.12 [-0.12– -0.12]
	Western Europe	-0.02 [-0.02–0.02]	-0.07 [-0.07– -0.07]
	Africa and Middle East	-0.02 [-0.02–0.02]	-0.07 [-0.07– -0.07]
	Rest of the World	-0.02 [-0.02–0.02]	-0.07 [-0.07– -0.07]

Note: Sensitivity analysis on elasticities of regional macroeconomic results with (mean [min–max]). Min and max are derived using two standard deviation around the mean. **Consumption (YP)** represents the spending by regional households on goods and services. It is influenced by factors such as income, prices, and preferences; **Investment (QINV)** refers to the aggregate volume of investment; **Price of Gross Domestic Product (PGDP)** is a measure used to evaluate the price level of all final goods and services produced within a country or region. This variable helps in comparing price levels across different regions and time periods within the model; **Quantity index of Gross Domestic Product (QGDP)** measures the real output of an economy, adjusted for inflation, and reflects the percentage change in the GDP quantity index. This variable is crucial for analysing economic growth and comparing the real economic performance of different regions within the model; **Trade (QXWREG)** captures the percentage change in real export volume by one country. This variable is essential for assessing international trade performance, evaluating the global demand for the local products and competitiveness in the global market within the model. **Welfare (EV)** captures a direct payment in millions of US \$ to households to compensate for welfare loss imposed by the scenarios.

Supplementary Table 19: Potential impact on quantities output with parameters sensitivity analysis, by scenario, sector, and region, % evolution compared to pre-H5N1 situation

<i>Output quantities (qo)</i>	Sector	Oceania	East Asia	Other Asia	Canada	Mexico	US	Latin America	Western Europe	Africa and Middle East	Rest of the World
S2	Grains and Crops	-0.37 [-0.45–0.29]	0.06 [0.06–0.06]	0.05 [0.05–0.05]	0.70 [0.70–0.70]	-0.37 [-0.45–0.29]	-0.28 [-0.30–0.26]	0.13 [0.13–0.13]	0.08 [0.08–0.08]	0.06 [0.06–0.06]	0.09 [0.09–0.09]
	Dairy	2.08 [1.54–2.62]	0.13 [0.13–0.13]	0.13 [0.11–0.15]	1.29 [0.99–1.59]	1.88 [1.66–2.10]	-9.33 [-9.95–8.71]	0.30 [0.24–0.36]	0.80 [0.58–1.02]	0.12 [0.10–0.14]	0.06 [0.04–0.08]
	Meats	4.72 [3.78–5.66]	0.43 [0.41–0.45]	0.17 [0.17–0.17]	6.26 [4.90–7.62]	3.41 [2.79–4.03]	-5.48 [-6.00–4.96]	0.50 [0.44–0.56]	0.11 [0.09–0.13]	0.04 [0.04–0.04]	0.03 [0.03–0.03]
	Cattle	3.55 [2.87–4.23]	0.25 [0.23–0.27]	0.10 [0.10–0.10]	9.94 [8.58–11.30]	5.35 [4.77–5.93]	0.18 [-0.36–0.72]	0.43 [0.37–0.49]	0.56 [0.48–0.64]	0.03 [0.03–0.03]	0.03 [0.03–0.03]
	Raw Milk	1.72 [1.26–2.18]	0.06 [0.06–0.06]	0.02 [0.02–0.02]	1.10 [0.86–1.34]	1.58 [1.40–1.76]	-0.01 [-0.61–0.59]	0.19 [0.15–0.23]	0.50 [0.36–0.64]	0.05 [0.05–0.05]	0.03 [0.03–0.03]
	Other Meat	-0.20 [-0.24–0.16]	0.00 [0.00–0.00]	0.01 [0.01–0.01]	0.07 [0.05–0.09]	-0.10 [-0.12–0.08]	-0.42 [-0.44–0.40]	0.02 [0.02–0.02]	0.03 [0.03–0.03]	0.01 [0.01–0.01]	0.02 [0.02–0.02]
	Processed Food	0.00 [-0.02–0.02]	0.01 [0.01–0.01]	0.03 [0.03–0.03]	0.31 [0.29–0.33]	0.09 [0.09–0.09]	-0.26 [-0.28–0.24]	0.04 [0.04–0.04]	0.06 [0.06–0.06]	0.01 [0.01–0.01]	0.03 [0.03–0.03]
	Manufacture	-0.26 [-0.30–0.22]	-0.03 [-0.03–0.03]	-0.03 [-0.03–0.03]	-0.18 [-0.20–0.16]	-0.15 [-0.17–0.13]	0.04 [0.02–0.06]	-0.06 [-0.06–0.06]	-0.03 [-0.03–0.03]	-0.02 [-0.02–0.02]	-0.02 [-0.02–0.02]
	Other Sectors	-0.04 [-0.04–0.04]	-0.01 [-0.01–0.01]	-0.01 [-0.01–0.01]	-0.01 [-0.01–0.01]	-0.03 [-0.03–0.03]	-0.13 [-0.13–0.13]	-0.01 [-0.01–0.01]	0.00 [0.00–0.00]	-0.01 [-0.01–0.01]	0.00 [0.00–0.00]
S3	Grains and Crops	-2.50 [-3.18–1.82]	0.20 [0.20–0.20]	0.17 [0.17–0.17]	2.39 [2.29–2.49]	-1.80 [-2.24–1.36]	-0.74 [-0.98–0.50]	0.38 [0.32–0.44]	0.30 [0.26–0.34]	0.23 [0.23–0.23]	0.35 [0.35–0.35]
	Dairy	9.28 [6.34–12.22]	0.69 [0.63–0.75]	0.69 [0.61–0.77]	6.15 [4.39–7.91]	9.05 [7.75–10.35]	-20.69 [-23.71–17.67]	1.54 [1.20–1.88]	3.84 [2.56–5.12]	0.62 [0.50–0.74]	0.30 [0.22–0.38]
	Meats	27.74 [20.38–35.10]	2.31 [2.15–2.47]	0.96 [0.90–1.02]	38.15 [26.91–49.39]	19.22 [14.78–23.66]	-28.90 [-32.48–25.32]	3.11 [2.53–3.69]	0.64 [0.54–0.74]	0.22 [0.20–0.24]	0.15 [0.13–0.17]
	Cattle	20.58 [15.36–25.80]	1.37 [1.27–1.47]	0.56 [0.50–0.62]	40.87 [33.41–48.33]	19.86 [17.22–22.50]	-8.12 [-12.08–4.16]	2.57 [2.11–3.03]	2.01 [1.79–2.23]	0.19 [0.17–0.21]	0.17 [0.15–0.19]
	Raw Milk	7.65 [5.23–10.07]	0.33 [0.29–0.37]	0.16 [0.14–0.18]	5.27 [3.93–6.61]	7.83 [6.85–8.81]	-3.87 [-7.09–0.65]	1.00 [0.78–1.22]	2.41 [1.63–3.19]	0.32 [0.26–0.38]	0.19 [0.15–0.23]
	Other Meat	-1.27 [-1.59–0.95]	0.01 [0.01–0.01]	0.04 [0.04–0.04]	0.08 [-0.04–0.20]	-0.41 [-0.49–0.33]	-1.32 [-1.44–1.20]	0.07 [0.07–0.07]	0.11 [0.11–0.11]	0.04 [0.04–0.04]	0.08 [0.08–0.08]
	Processed Food	-0.15 [-0.25–0.05]	0.05 [0.05–0.05]	0.14 [0.14–0.14]	1.23 [1.17–1.29]	0.36 [0.34–0.38]	-0.74 [-0.84–0.64]	0.17 [0.17–0.17]	0.25 [0.23–0.27]	0.05 [0.05–0.05]	0.11 [0.11–0.11]
	Manufacture	-1.46 [-1.76–1.16]	-0.12 [-0.12–0.12]	-0.15 [-0.15–0.15]	-0.89 [-1.03–0.15]	-0.81 [-0.91–0.71]	0.43 [0.35–0.51]	-0.30 [-0.32–0.28]	-0.14 [-0.16–0.12]	-0.08 [-0.08–0.08]	-0.07 [-0.07–0.07]
	Other Sectors	-0.19 [-0.23–0.15]	-0.03 [-0.03–0.03]	-0.02 [-0.02–0.02]	-0.03 [-0.03–0.03]	-0.09 [-0.09–0.09]	-0.42 [-0.42–0.42]	-0.03 [-0.03–0.03]	-0.01 [-0.01–0.01]	-0.02 [-0.02–0.02]	-0.01 [-0.01–0.01]

Note: **qo** are the output quantities in a specific activity in a region. Values are expressed as mean [min–max] percentage changes from pre-H5N1 conditions.

Supplementary Table 20: Potential impact on output prices with parameters sensitivity analysis, by scenario, sector, and region, % evolution compared to pre-H5N1 situation

<i>Output prices (po)</i>	Sector	Oceania	East Asia	Other Asia	Canada	Mexico	US	Latin America	Western Europe	Africa and Middle East	Rest of the World
S2	Grains and Crops	0.32 [0.28–0.36]	0.08 [0.08–0.08]	0.08 [0.08–0.08]	0.14 [0.12–0.16]	0.55 [0.53–0.57]	0.51 [0.49–0.53]	0.13 [0.13–0.13]	0.10 [0.10–0.10]	0.07 [0.07–0.07]	0.06 [0.06–0.06]
	Dairy	0.26 [0.22–0.30]	0.05 [0.05–0.05]	0.05 [0.05–0.05]	0.11 [0.11–0.11]	0.26 [0.24–0.28]	22.38 [22.34–22.42]	0.07 [0.07–0.07]	0.06 [0.06–0.06]	0.04 [0.04–0.04]	0.03 [0.03–0.03]
	Meats	0.26 [0.22–0.30]	0.06 [0.06–0.06]	0.07 [0.07–0.07]	0.29 [0.27–0.31]	0.81 [0.73–0.89]	13.89 [13.83–13.95]	0.12 [0.12–0.12]	0.06 [0.06–0.06]	0.03 [0.03–0.03]	0.04 [0.04–0.04]
	Cattle	0.58 [0.50–0.66]	0.10 [0.10–0.10]	0.09 [0.09–0.09]	0.31 [0.27–0.35]	1.44 [1.30–1.58]	15.45 [15.37–15.53]	0.17 [0.17–0.17]	0.13 [0.11–0.15]	0.07 [0.07–0.07]	0.05 [0.05–0.05]
	Raw Milk	0.45 [0.39–0.51]	0.07 [0.07–0.07]	0.08 [0.08–0.08]	0.18 [0.16–0.20]	0.79 [0.75–0.83]	19.38 [19.34–19.42]	0.15 [0.15–0.15]	0.15 [0.13–0.17]	0.07 [0.07–0.07]	0.05 [0.05–0.05]
	Other Meat	0.19 [0.17–0.21]	0.05 [0.05–0.05]	0.05 [0.05–0.05]	0.10 [0.10–0.10]	0.22 [0.20–0.24]	0.29 [0.27–0.31]	0.08 [0.08–0.08]	0.05 [0.05–0.05]	0.04 [0.04–0.04]	0.04 [0.04–0.04]
	Processed Food	0.13 [0.11–0.15]	0.04 [0.04–0.04]	0.04 [0.04–0.04]	0.10 [0.10–0.10]	0.10 [0.10–0.10]	0.58 [0.58–0.58]	0.06 [0.06–0.06]	0.03 [0.03–0.03]	0.04 [0.04–0.04]	0.03 [0.03–0.03]
	Manufacture	0.09 [0.07–0.11]	0.02 [0.02–0.02]	0.02 [0.02–0.02]	0.03 [0.03–0.03]	0.02 [0.02–0.02]	-0.03 [-0.03– -0.03]	0.03 [0.03–0.03]	0.02 [0.02–0.02]	0.02 [0.02–0.02]	0.02 [0.02–0.02]
	Other Sectors	0.10 [0.08–0.12]	0.02 [0.02–0.02]	0.02 [0.02–0.02]	0.05 [0.05–0.05]	0.03 [0.03–0.03]	-0.04 [-0.04– -0.04]	0.04 [0.04–0.04]	0.02 [0.02–0.02]	0.02 [0.02–0.02]	0.02 [0.02–0.02]
S3	Grains and Crops	1.73 [1.43–2.03]	0.32 [0.32–0.32]	0.32 [0.32–0.32]	0.62 [0.54–0.70]	2.12 [1.98–2.26]	1.61 [1.39–1.83]	0.54 [0.52–0.56]	0.42 [0.36–0.48]	0.29 [0.29–0.29]	0.23 [0.21–0.25]
	Dairy	1.41 [1.17–1.65]	0.24 [0.24–0.24]	0.22 [0.22–0.22]	0.49 [0.43–0.55]	1.23 [1.13–1.33]	82.93 [82.13–83.73]	0.34 [0.32–0.36]	0.25 [0.21–0.29]	0.16 [0.16–0.16]	0.13 [0.13–0.13]
	Meats	1.49 [1.19–1.79]	0.30 [0.28–0.32]	0.33 [0.31–0.35]	1.35 [1.21–1.49]	3.27 [2.91–3.63]	52.10 [51.36–52.84]	0.59 [0.53–0.65]	0.26 [0.24–0.28]	0.16 [0.16–0.16]	0.17 [0.17–0.17]
	Cattle	3.40 [2.66–4.14]	0.48 [0.46–0.50]	0.43 [0.41–0.45]	1.38 [1.16–1.60]	5.67 [5.03–6.31]	36.11 [35.29–36.93]	0.82 [0.74–0.90]	0.55 [0.49–0.61]	0.28 [0.26–0.30]	0.23 [0.21–0.25]
	Raw Milk	2.41 [1.99–2.83]	0.31 [0.31–0.31]	0.34 [0.32–0.36]	0.80 [0.72–0.88]	3.46 [3.18–3.74]	111.49 [110.73–112.25]	0.67 [0.63–0.71]	0.69 [0.55–0.83]	0.29 [0.27–0.31]	0.22 [0.20–0.24]
	Other Meat	1.00 [0.84–1.16]	0.22 [0.22–0.22]	0.19 [0.19–0.19]	0.43 [0.39–0.47]	0.92 [0.86–0.98]	0.88 [0.76–1.00]	0.37 [0.35–0.39]	0.23 [0.21–0.25]	0.16 [0.16–0.16]	0.16 [0.16–0.16]
	Processed Food	0.70 [0.58–0.82]	0.18 [0.18–0.18]	0.18 [0.18–0.18]	0.42 [0.38–0.46]	0.47 [0.45–0.49]	2.14 [2.06–2.22]	0.26 [0.24–0.28]	0.15 [0.13–0.17]	0.15 [0.15–0.15]	0.11 [0.11–0.11]
	Manufacture	0.47 [0.39–0.55]	0.08 [0.08–0.08]	0.08 [0.08–0.08]	0.15 [0.13–0.17]	0.11 [0.09–0.13]	-0.20 [-0.22– -0.18]	0.16 [0.14–0.18]	0.09 [0.09–0.09]	0.08 [0.08–0.08]	0.08 [0.08–0.08]
	Other Sectors	0.54 [0.44–0.64]	0.08 [0.08–0.08]	0.08 [0.08–0.08]	0.25 [0.21–0.29]	0.21 [0.17–0.25]	-0.24 [-0.28– -0.20]	0.18 [0.16–0.20]	0.09 [0.07–0.11]	0.08 [0.08–0.08]	0.08 [0.08–0.08]

Note: **po** is the output prices in a specific activity in a region. Values are expressed as mean [min–max] percentage changes from pre-H5N1 conditions.

Supplementary Table 21: Potential impact on investment with parameters sensitivity analysis, by scenario, sector, and region, % evolution compared to pre-H5N1 situation

<i>Investment (qid)</i>	Sector	Oceania	East Asia	Other Asia	Canada	Mexico	US	Latin America	Western Europe	Africa and Middle East	Rest of the World
S2	Grains and Crops	0.06 [0.06–0.06]	0.05 [0.05–0.05]	0.03 [0.03–0.03]	0.11 [0.11–0.11]	-0.01 [-0.03–0.01]	-0.23 [-0.23– -0.23]	0.06 [0.06–0.06]	0.05 [0.05–0.05]	0.05 [0.05–0.05]	0.04 [0.04–0.04]
	Dairy	0.32 [0.32–0.32]	0.36 [0.34–0.38]	0.08 [0.08–0.08]	0.09 [0.09–0.09]	3.11 [3.09–3.13]	-20.07 [-24.59– -15.55]	0.05 [0.05–0.05]	0.04 [0.04–0.04]	0.18 [0.16–0.20]	0.06 [0.06–0.06]
	Meats	0.11 [0.11–0.11]	1.84 [1.80–1.88]	0.17 [0.17–0.17]	0.10 [0.10–0.10]	3.55 [3.53–3.57]	-14.53 [-17.61– -11.45]	0.05 [0.05–0.05]	0.12 [0.12–0.12]	0.18 [0.18–0.18]	0.14 [0.14–0.14]
	Cattle	0.08 [0.08–0.08]	0.04 [0.04–0.04]	0.09 [0.07–0.11]	0.11 [0.11–0.11]	6.87 [6.81–6.93]	-0.31 [-0.33– -0.29]	0.07 [0.07–0.07]	0.06 [0.06–0.06]	0.03 [0.03–0.03]	0.04 [0.04–0.04]
	Raw Milk	0.07 [0.07–0.07]	0.01 [0.01–0.01]	0.02 [0.02–0.02]	0.08 [0.08–0.08]	0.03 [0.03–0.03]	-0.23 [-0.25– -0.21]	0.05 [0.05–0.05]	0.04 [0.04–0.04]	0.02 [0.02–0.02]	0.03 [0.03–0.03]
	Other Meat	0.06 [0.06–0.06]	0.02 [0.02–0.02]	0.02 [0.02–0.02]	0.09 [0.09–0.09]	0.08 [0.06–0.10]	-0.20 [-0.20– -0.20]	0.05 [0.05–0.05]	0.04 [0.04–0.04]	0.04 [0.04–0.04]	0.03 [0.03–0.03]
	Processed Food	0.05 [0.05–0.05]	0.04 [0.04–0.04]	0.02 [0.02–0.02]	0.08 [0.08–0.08]	0.24 [0.24–0.24]	-0.45 [-0.45– -0.45]	0.05 [0.05–0.05]	0.05 [0.05–0.05]	0.03 [0.03–0.03]	0.04 [0.04–0.04]
	Manufacture	-0.13 [-0.15– -0.11]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	-0.03 [-0.03– -0.03]	-0.03 [-0.03– -0.03]	-0.10 [-0.10– -0.10]	0.00 [0.00–0.00]	0.03 [0.03–0.03]	0.02 [0.02–0.02]	0.02 [0.02–0.02]
	Other Sectors	0.06 [0.06–0.06]	0.01 [0.01–0.01]	0.01 [0.01–0.01]	0.07 [0.07–0.07]	0.03 [0.03–0.03]	-0.18 [-0.18– -0.18]	0.05 [0.05–0.05]	0.04 [0.04–0.04]	0.02 [0.02–0.02]	0.03 [0.03–0.03]
	Grains and Crops	0.30 [0.26–0.34]	0.15 [0.15–0.15]	0.12 [0.12–0.12]	0.46 [0.42–0.50]	-0.11 [-0.21– -0.01]	-0.77 [-0.81– -0.73]	0.24 [0.24–0.24]	0.19 [0.17–0.21]	0.18 [0.18–0.18]	0.14 [0.14–0.14]
	Dairy	1.61 [1.55–1.67]	1.90 [1.78–2.02]	0.40 [0.38–0.42]	0.44 [0.38–0.50]	16.31 [16.23– 16.39]	-60.65 [-72.25– -49.05]	0.23 [0.21–0.25]	0.17 [0.17–0.17]	0.90 [0.82–0.98]	0.29 [0.27–0.31]
S3	Meats	0.53 [0.49–0.57]	9.99 [9.63–10.35]	0.87 [0.81–0.93]	0.48 [0.42–0.54]	17.82 [17.72– 17.92]	-47.44 [-56.62– -38.26]	0.22 [0.20–0.24]	0.59 [0.55–0.63]	0.93 [0.85–1.01]	0.66 [0.62–0.70]
	Cattle	0.37 [0.33–0.41]	0.20 [0.20–0.20]	0.53 [0.43–0.63]	0.56 [0.50–0.62]	37.22 [36.70– 37.74]	-0.95 [-1.03– -0.87]	0.33 [0.31–0.35]	0.28 [0.28–0.28]	0.16 [0.16–0.16]	0.15 [0.15–0.15]
	Raw Milk	0.32 [0.28–0.36]	0.04 [0.04–0.04]	0.06 [0.06–0.06]	0.38 [0.32–0.44]	0.20 [0.18–0.22]	-1.11 [-1.33– -0.89]	0.21 [0.19–0.23]	0.14 [0.14–0.14]	0.09 [0.09–0.09]	0.11 [0.11–0.11]
	Other Meat	0.24 [0.22–0.26]	0.05 [0.05–0.05]	0.08 [0.08–0.08]	0.42 [0.38–0.46]	0.00 [-0.18–0.18]	-0.71 [-0.71– -0.71]	0.21 [0.21–0.21]	0.15 [0.15–0.15]	0.14 [0.14–0.14]	0.13 [0.13–0.13]
	Processed Food	0.21 [0.21–0.21]	0.14 [0.14–0.14]	0.08 [0.08–0.08]	0.40 [0.34–0.46]	0.89 [0.87–0.91]	-1.63 [-1.67– -1.59]	0.22 [0.20–0.24]	0.19 [0.19–0.19]	0.13 [0.13–0.13]	0.15 [0.15–0.15]
	Manufacture	-0.79 [-0.97– -0.61]	0.02 [0.02–0.02]	0.02 [0.02–0.02]	-0.23 [-0.27– -0.19]	-0.20 [-0.22– -0.18]	-0.22 [-0.26– -0.18]	-0.02 [-0.02– -0.02]	0.11 [0.11–0.11]	0.06 [0.06–0.06]	0.09 [0.09–0.09]
	Other Sectors	0.31 [0.27–0.35]	0.04 [0.04–0.04]	0.05 [0.05–0.05]	0.38 [0.32–0.44]	0.20 [0.18–0.22]	-0.65 [-0.65– -0.65]	0.20 [0.18–0.22]	0.14 [0.14–0.14]	0.09 [0.09–0.09]	0.11 [0.11–0.11]

Note: **qid** is investment in a specific activity in a region. Values are expressed as mean [min–max] percentage changes from pre-H5N1 conditions.

Supplementary Table 22: Potential impact on traded quantities with parameters sensitivity analysis, by scenario, sector, and region, % evolution compared to pre-H5N1 situation

<i>Traded quantities (qxw)</i>	Sector	Oceania	East Asia	Other Asia	Canada	Mexico	US	Latin America	Western Europe	Africa and Middle East	Rest of the World
S2	Grains and Crops	-0.75 [-0.91–0.59]	0.35 [0.35–0.35]	0.36 [0.36–0.36]	0.28 [0.22–0.34]	-1.01 [-1.15–0.87]	-1.30 [-1.40–1.20]	0.29 [0.27–0.31]	0.13 [0.11–0.15]	0.32 [0.32–0.32]	0.28 [0.28–0.28]
	Dairy	3.57 [2.61–4.53]	4.45 [3.47–5.43]	3.49 [2.75–4.23]	35.52 [24.78–46.26]	37.25 [26.03–48.47]	-15.00 [-15.00–15.00]	6.50 [4.94–8.06]	2.85 [2.07–3.63]	1.19 [0.93–1.45]	0.58 [0.44–0.72]
	Meats	9.67 [7.73–11.61]	4.12 [3.32–4.92]	0.78 [0.74–0.82]	26.24 [20.00–32.48]	27.40 [20.76–34.04]	-15.00 [-15.00–15.00]	3.45 [2.97–3.93]	0.51 [0.45–0.57]	1.20 [1.06–1.34]	0.71 [0.61–0.81]
	Cattle	0.50 [0.40–0.60]	4.53 [4.07–4.99]	0.65 [0.59–0.71]	31.48 [24.74–38.22]	28.31 [22.75–33.87]	-15.00 [-15.00–15.00]	1.60 [1.34–1.86]	3.03 [2.51–3.55]	0.48 [0.44–0.52]	0.77 [0.69–0.85]
	Raw Milk	1.19 [0.41–1.97]	4.50 [3.56–5.44]	9.13 [6.91–11.35]	24.86 [18.14–31.58]	30.23 [21.57–38.89]	-75.00 [-75.00–75.00]	16.23 [11.01–21.45]	4.51 [3.39–5.63]	8.76 [6.62–10.90]	7.22 [5.52–8.92]
	Other Meat	-0.60 [-0.72–0.48]	0.29 [0.29–0.29]	0.29 [0.29–0.29]	0.04 [0.02–0.06]	-0.74 [-0.82–0.66]	-0.92 [-1.00–0.84]	0.08 [0.06–0.10]	0.08 [0.08–0.08]	0.20 [0.20–0.20]	0.19 [0.19–0.19]
	Processed Food	-0.10 [-0.14–0.06]	0.17 [0.17–0.17]	0.17 [0.17–0.17]	0.18 [0.16–0.20]	0.19 [0.17–0.21]	-1.37 [-1.41–1.33]	0.13 [0.13–0.13]	0.11 [0.11–0.11]	0.08 [0.08–0.08]	0.11 [0.11–0.11]
	Manufacture	-0.52 [-0.60–0.44]	-0.06 [-0.06–0.06]	-0.06 [-0.06–0.06]	-0.26 [-0.28–0.24]	-0.19 [-0.21–0.17]	0.28 [0.26–0.30]	-0.19 [-0.19–0.19]	-0.05 [-0.05–0.05]	-0.04 [-0.04–0.04]	-0.04 [-0.04–0.04]
	Other Sectors	-0.48 [-0.54–0.42]	-0.02 [-0.02–0.02]	-0.03 [-0.03–0.03]	-0.31 [-0.35–0.27]	-0.18 [-0.20–0.16]	0.34 [0.30–0.38]	-0.16 [-0.16–0.16]	-0.05 [-0.05–0.05]	-0.03 [-0.03–0.03]	-0.03 [-0.03–0.03]
S3	Grains and Crops	-4.8 [-6.0–3.6]	1.25 [1.23–1.27]	1.3 [1.26–1.34]	0.6 [0.18–1.02]	-4.32 [-5.06–3.58]	-3.51 [-4.31–2.71]	0.76 [0.62–0.90]	0.44 [0.36–0.52]	1.2 [1.18–1.22]	1.05 [1.05–1.05]
	Dairy	15.86 [10.70–21.02]	22.11 [16.35–27.87]	17.44 [13.04–21.84]	164.39 [102.61–226.17]	166.45 [104.47–228.43]	-75.00 [-75.00–75.00]	32.08 [23.00–41.16]	13.67 [9.13–18.21]	5.86 [4.36–7.36]	2.82 [2.02–3.62]
	Meats	56.88 [41.80–71.96]	25.67 [18.35–32.99]	4.37 [4.05–4.69]	162.37 [110.59–214.15]	158.18 [110.40–205.96]	-75.00 [-75.00–75.00]	21.35 [17.13–25.57]	3.02 [2.56–3.48]	6.95 [5.65–8.25]	4.17 [3.29–5.05]
	Cattle	1.44 [0.74–2.14]	21.68 [18.92–24.44]	3.57 [3.09–4.05]	66.75 [46.67–86.83]	45.67 [30.33–61.01]	-75.00 [-75.00–75.00]	5.30 [4.54–6.06]	9.56 [8.04–11.08]	2.14 [2.00–2.28]	3.11 [2.87–3.35]
	Raw Milk	27.25 [6.87–47.63]	57.86 [27.48–88.24]	134.29 [62.59–205.99]	394.26 [181.06–607.46]	464.38 [218.86–709.90]	-90.00 [-90.00–90.00]	249.22 [114.80–383.64]	66.33 [30.69–101.97]	129.59 [60.53–198.65]	104.14 [49.08–159.20]
	Other Meat	-3.73 [-4.63–2.83]	1.05 [1.03–1.07]	1.09 [1.07–1.11]	-0.19 [-0.45–0.07]	-3.33 [-3.75–2.91]	-2.17 [-2.79–1.55]	-0.01 [-0.13–0.11]	0.30 [0.26–0.34]	0.76 [0.74–0.78]	0.74 [0.72–0.76]
	Processed Food	-0.86 [-1.20–0.52]	0.68 [0.68–0.68]	0.67 [0.65–0.69]	0.58 [0.42–0.74]	0.52 [0.36–0.68]	-4.82 [-5.10–4.54]	0.46 [0.42–0.50]	0.46 [0.46–0.46]	0.33 [0.31–0.35]	0.44 [0.44–0.44]
	Manufacture	-2.84 [-3.38–2.30]	-0.27 [-0.29–0.25]	-0.26 [-0.28–0.24]	-1.20 [-1.38–1.02]	-1.01 [-1.11–0.91]	1.55 [1.37–1.73]	-0.91 [-0.97–0.85]	-0.21 [-0.25–0.17]	-0.17 [-0.19–0.15]	-0.17 [-0.19–0.15]
	Other Sectors	-2.63 [-3.13–2.13]	-0.09 [-0.11–0.07]	-0.11 [-0.13–0.09]	-1.49 [-1.73–1.25]	-1.21 [-1.39–1.03]	1.87 [1.63–2.11]	-0.76 [-0.80–0.72]	-0.21 [-0.23–0.19]	-0.13 [-0.13–0.13]	-0.14 [-0.14–0.14]

Note: **qxw** traded quantities in a specific activity in a region. Values are expressed as mean [min–max] percentage changes from pre-H5N1 conditions.

Supplementary Table 23: Potential impact on employment of unskilled labour with parameters sensitivity analysis, by scenario, sector, and region, % evolution compared to pre-H5N1 situation

<i>Unemployment (qes)</i>	<i>Sector</i>	<i>Oceania</i>	<i>East Asia</i>	<i>Other Asia</i>	<i>Canada</i>	<i>Mexico</i>	<i>US</i>	<i>Latin America</i>	<i>Western Europe</i>	<i>Africa and Middle East</i>	<i>Rest of the World</i>
S2	Grains and Crops	-0.24 [-0.30– -0.18]	0.08 [0.08–0.08]	0.06 [0.06–0.06]	0.77 [0.75–0.79]	-0.19 [-0.25– -0.13]	-0.02 [-0.04–0.00]	0.17 [0.17–0.17]	0.12 [0.12–0.12]	0.08 [0.08–0.08]	0.10 [0.10–0.10]
	Dairy	2.10 [1.56–2.64]	0.11 [0.11–0.11]	0.11 [0.09–0.13]	1.29 [0.99–1.59]	1.84 [1.62–2.06]	1.90 [1.20–2.60]	0.30 [0.24–0.36]	0.80 [0.58–1.02]	0.11 [0.09–0.13]	0.06 [0.04–0.08]
	Meats	4.73 [3.79–5.67]	0.42 [0.40–0.44]	0.15 [0.15–0.15]	6.26 [4.90–7.62]	3.37 [2.75–3.99]	1.01 [0.47–1.55]	0.50 [0.44–0.56]	0.10 [0.08–0.12]	0.03 [0.03–0.03]	0.02 [0.02–0.02]
	Cattle	3.84 [3.12–4.56]	0.29 [0.27–0.31]	0.12 [0.12–0.12]	10.09 [8.71–11.47]	5.91 [5.27–6.55]	12.16 [11.52–12.80]	0.48 [0.42–0.54]	0.62 [0.54–0.70]	0.05 [0.05–0.05]	0.05 [0.05–0.05]
	Raw Milk	1.90 [1.42–2.38]	0.08 [0.08–0.08]	0.04 [0.04–0.04]	1.17 [0.93–1.41]	1.89 [1.71–2.07]	23.53 [22.75–24.31]	0.24 [0.20–0.28]	0.56 [0.42–0.70]	0.07 [0.07–0.07]	0.04 [0.04–0.04]
	Other Meat	-0.12 [-0.16– -0.08]	0.02 [0.02–0.02]	0.02 [0.02–0.02]	0.10 [0.08–0.12]	0.00 [0.00–0.00]	-0.31 [-0.31– -0.31]	0.05 [0.05–0.05]	0.05 [0.05–0.05]	0.02 [0.02–0.02]	0.03 [0.03–0.03]
	Processed Food	0.01 [0.01–0.01]	0.00 [0.00–0.00]	0.02 [0.02–0.02]	0.31 [0.29–0.33]	0.05 [0.05–0.05]	-0.50 [-0.52– -0.48]	0.04 [0.04–0.04]	0.06 [0.06–0.06]	0.00 [0.00–0.00]	0.02 [0.02–0.02]
	Manufacture	-0.25 [-0.29– -0.21]	-0.04 [-0.04– -0.04]	-0.05 [-0.05– -0.05]	-0.18 [-0.20– -0.16]	-0.19 [-0.21– -0.17]	-0.21 [-0.23– -0.19]	-0.07 [-0.07– -0.07]	-0.04 [-0.04– -0.04]	-0.03 [-0.03– -0.03]	-0.02 [-0.02– -0.02]
	Other Sectors	-0.02 [-0.02– -0.02]	-0.03 [-0.03– -0.03]	-0.03 [-0.03– -0.03]	-0.01 [-0.01– -0.01]	-0.08 [-0.08– -0.08]	-0.45 [-0.45– -0.45]	-0.02 [-0.02– -0.02]	-0.01 [-0.01– -0.01]	-0.02 [-0.02– -0.02]	-0.01 [-0.01– -0.01]
S3	Grains and Crops	-1.82 [-2.38– -1.26]	0.28 [0.26–0.30]	0.24 [0.24–0.24]	2.67 [2.59–2.75]	-1.13 [-1.53– -0.73]	0.13 [-0.01–0.27]	0.54 [0.50–0.58]	0.45 [0.43–0.47]	0.29 [0.29–0.29]	0.41 [0.41–0.41]
	Dairy	9.37 [6.43–12.31]	0.64 [0.58–0.70]	0.62 [0.54–0.70]	6.19 [4.43–7.95]	8.91 [7.61–10.21]	1.21 [-2.65–5.07]	1.52 [1.18–1.86]	3.83 [2.55–5.11]	0.58 [0.46–0.70]	0.29 [0.21–0.37]
	Meats	27.84 [20.46– 35.22]	2.26 [2.10–2.42]	0.89 [0.83–0.95]	38.2 [27.92– 48.48]	19.06 [14.62– 23.50]	-8.55 [-13.15– -3.95]	3.09 [2.51–3.67]	0.63 [0.53–0.73]	0.19 [0.17–0.21]	0.13 [0.11–0.15]
	Cattle	22.55 [16.83– 28.27]	1.53 [1.43–1.63]	0.66 [0.60–0.72]	41.72 [34.08– 49.36]	22.3 [19.32– 25.28]	16.65 [11.25–22.05]	2.83 [2.35–3.31]	2.25 [2.01–2.49]	0.25 [0.23–0.27]	0.23 [0.21–0.25]
	Raw Milk	8.65 [6.07–11.23]	0.42 [0.38–0.46]	0.22 [0.20–0.24]	5.59 [4.19–6.99]	9.21 [8.15–10.27]	117.76 [109.88–125.64]	1.20 [0.98–1.42]	2.66 [1.82–3.50]	0.39 [0.33–0.45]	0.24 [0.20–0.28]
	Other Meat	-0.89 [-1.15– -0.63]	0.07 [0.07–0.07]	0.07 [0.07–0.07]	0.21 [0.09–0.33]	-0.04 [-0.08–0.00]	-0.96 [-1.02– -0.90]	0.19 [0.19–0.19]	0.21 [0.21–0.21]	0.07 [0.07–0.07]	0.13 [0.13–0.13]
	Processed Food	-0.07 [-0.15–0.01]	-0.01 [-0.01– -0.01]	0.08 [0.08–0.08]	1.27 [1.19–1.35]	0.23 [0.23–0.23]	-1.49 [-1.59– -1.39]	0.14 [0.14–0.14]	0.24 [0.22–0.26]	0.02 [0.02–0.02]	0.09 [0.09–0.09]
	Manufacture	-1.37 [-1.65– -1.09]	-0.19 [-0.19– -0.19]	-0.22 [-0.22– -0.22]	-0.85 [-0.97– -0.73]	-0.93 [-1.01– -0.85]	-0.37 [-0.45– -0.29]	-0.33 [-0.35– -0.31]	-0.16 [-0.18– -0.14]	-0.12 [-0.12– -0.12]	-0.08 [-0.08– -0.08]
	Other Sectors	-0.09 [-0.11– -0.07]	-0.10 [-0.10– -0.10]	-0.10 [-0.10– -0.10]	0.01 [-0.03–0.05]	-0.25 [-0.27– -0.23]	-1.44 [-1.46– -1.42]	-0.05 [-0.05– -0.05]	-0.02 [-0.02– -0.02]	-0.06 [-0.06– -0.06]	-0.03 [-0.03– -0.03]

Note: **qes** unemployment in a specific activity in a region. Values are expressed as mean [min–max] percentage changes from pre-H5N1 conditions.

Supplementary 6 Conversion of USD impact estimates to % of GDP estimates

In the USA, the 2003 BSE outbreak caused estimated total losses to the beef industry of between \$3.2 billion and \$4.7 billion²⁶. Given US GDP of \$14.08 trillion in 2002 according to the World Bank²⁷, these figures translate to approximately 0.02% and 0.03% of GDP. For FMD outbreaks, the literature estimated cumulative GDP losses of up to \$47 billion over ten years in the USA²⁸. Using the same approach and taking US GDP of \$17.77 trillion in 2014²⁷, these losses represent approximately 0.26% of GDP. Finally, in Brazil, domestic welfare losses were estimated to range between \$132 million and \$271 million²⁴. Because these authors employed the GTAP model, absolute losses in monetary terms were converted to percentage by dividing the estimate by the country's annual GDP figures obtained from the GTAP database. Accordingly, these losses correspond to approximately 0.006% and 0.013% of GDP, respectively.

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