

Supplementary materials

Table S1. Number by cases data

Serial No.	Data	Data source
1.	Total value of animal loss, PPP	Calculation
2.	Total value of production decrease, PPP	Calculation
3.	Sum	Calculation
4.	2020 Population (poultry)	Federal Ministry of Agriculture and Rural Development (FMARD) (2020)
5.	Pop. Weight	Calculation (from FMARD source)
6.	Number of cases	Calculation from Salmonellosis loss Animal, Peer-reviewed literature, experts' opinions.
7.	Farm-gate price of a healthy animal(local currency)	Field survey
8.	Farm-gate price of a healthy animal(USD PPP)	Calculation from row 8
9.	Value of animals lost per case (USD PPP)	Calculation
10.	Value of production lost per case (USD PPP)	Calculation
11.	TOTAL loss per case (USD PPP)	Calculation
12.	Loss per case as a percentage of the farm-gate price of a healthy animal	Calculation
13.	Total loss from livestock keepers, PPP	Calculation
14.	Total loss from consumers, PPP	Calculation
15.	Total loss caused by \ NTS (salmonellosis)	Calculation
16.	PPP conversion factor (GDP, World Bank) 2020	World Bank, https://data.worldbank.org/indicator/PA.NUS.PPP?locations=NG
17.	Agriculture, value added (% of GDP), 2010 – 2021	World Bank, https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?locations=NG
18.	GDP (current US\$), 2010 – 2021	World Bank, https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=NG&start=2010
19.	GDP, PPP (constant 2011 international \$), 2010 – 2021	World Bank, https://data.worldbank.org/indicator/NY.GDP.MKTP.PP.CD?end=2021&locations=NG&start=2009
20.	GDP, PPP (constant 2017 international \$), 2010 – 2021	World Bank, https://data.worldbank.org/indicator/NY.GNP.MKTP.PP.KD?end=2021&locations=NG&start=2009
21.	Animal losses as percentage of Agric. GDP	Calculation
22.	Animal losses as percentage of Poultry GDP	Calculation
23.	Animal losses as percentage of Agriculture Budget Expenditure	Calculation
24.	Human losses as percentage of GDP	Calculation
25.	Human losses as percentage of Health Budget Expenditure	Calculation
26.	Budget allocation (2016/2017)	Federal Ministry of Finance (2020)
27.	Budget allocation (2017/2018)	Federal Ministry of Finance (2020)
28.	Budget allocation (2018/2019)	Federal Ministry of Finance (2020)
29.	Budget allocation (2019/2020)	Federal Ministry of Finance (2020)
30.	Budget expenditure (2016/2017)	Federal Ministry of Finance (2020)
31.	Budget expenditure (2017/2018)	Federal Ministry of Finance (2020)
32.	Budget expenditure (2018/2019)	Federal Ministry of Finance (2020)
33.	Budget expenditure (2019/2020)	Federal Ministry of Finance (2020)
34.	Animal loss, PPP	Calculation
35.	Production Decrease, PPP	Calculation
36.	Social cost - Livestock keepers, PPP	Calculation
37.	Social cost - Consumers, PPP	Calculation
38.	Total costs	Calculation

Data from database: World Development Indicators, Last Updated: 26/08/2022 (<https://databank.worldbank.org/source/world-development-indicators>).

Table S2. Basic Check on data

Serial No.	Salmonellosis	Poultry			Poultry Keeper	Consumers			Sources
1.	Prevalence	Calculation			Calculation	Calculation			Field data, PS brief, Literature
2.	Fatality (over total case = case fatality)	Calculation			Calculation	Calculation			Field data, PS brief, Literature
	Salmonellosis	Poultry			Livestock keepers			Consumers	
		Intensive (large-scale)	Intensive (small & medium-scale)	Free-range/Semi-intensive (indigenous)	Intensive (large-scale)	Intensive (small & medium-scale)	Free-range/Semi-intensive (indigenous)		
3.	Case/ population	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	
4.	Fatality (over total case = case fatality)	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	

Data from Federal Ministry of Agriculture and Rural Development (2020).

Table S3. Total Loss

Serial No.	Data	Data source	Comment
1.	Total value of animal loss, PPP	Calculation	
2.	Total value of production decrease, PPP	Calculation	
3.	Total loss from livestock keepers, PPP	Calculation	
4.	Total loss from consumers, PPP	Calculation	
5.	Total loss caused by Salmonella	Calculation	
6.	Animal losses as percentage of Agric. GDP	Calculation	
7.	Animal losses as percentage of Poultry GDP	Calculation	
8.	Animal losses as percentage of Agriculture Budget Expenditure	Calculation	
9.	Human losses as percentage of GDP	Calculation	
10.	Human losses as percentage of Health Budget Expenditure	Calculation	
11.	PPP conversion factor (GDP, World Bank) 2020	World Bank, https://data.worldbank.org/indicator/PA.NUS.PPP?locations=NG	
12.	Agriculture, value added (% of GDP), 2010 – 2021	World Bank, https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?locations=NG	
13.	GDP (current US\$), 2010 – 2021	World Bank, https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=NG&start=2010	
14.	GDP, PPP (constant 2011 international \$), 2010 – 2021	World Bank, https://data.worldbank.org/indicator/NY.GDP.MKTP.PP.CD?end=2021&locations=NG&start=2009	
15.	GDP, PPP (constant 2017 international \$), 2010 - 2021	World Bank, https://data.worldbank.org/indicator/NY.GNP.MKTP.PP.KD?end=2021&locations=NG&start=2009	

Data from database: World Development Indicators, Last Updated: 26/08/2022 (<https://databank.worldbank.org/source/world-development-indicators>).

Table S5. Salmonellosis Loss (Poultry)

Serial No.	Data	Intensive (large-scale)	Intensive (small & medium-scale)	Free-range/Semi-intensive (indigenous)	Total	Source
1.	Poultry population	Calculation	Calculation	Calculation	Calculation	Input data
2.	Number of cases	Calculation	Calculation	Calculation	Calculation	Input data
	I. Value of animals Lost	Calculation	Calculation	Calculation	Calculation	Input data
3.	Number of deaths	Calculation	Calculation	Calculation	Calculation	Input data
4.	Price per animal	Calculation	Calculation	Calculation	Calculation	Input data
5.	Value of animals lost	Calculation	Calculation	Calculation	Calculation	Input data
6.	II. Loss from salvage slaughter and culling	Calculation	Calculation	Calculation	Calculation	Input data
7.	Number of salvage slaughter*	Calculation	Calculation	Calculation	Calculation	Input data
8.	Number of culls*	Calculation	Calculation	Calculation	Calculation	Input data
9.	Price of salvage slaughtered/culled animal	Calculation	Calculation	Calculation	Calculation	Input data
10.	*Number of salvage slaughter and deaths is higher than number of cases as often the whole flock is slaughtered/culled	Calculation	Calculation	Calculation	Calculation	Input data
11.	Value of loss from salvage slaughter and culling	Calculation	Calculation	Calculation	Calculation	Input data
12.	III. Value of foregone production	Calculation	Calculation	Calculation	Calculation	Input data
13.	Percentage of cases in salvage slaughter	Calculation	Calculation	Calculation	Calculation	Input data
14.	Number of survivors	Calculation	Calculation	Calculation	Calculation	Input data
15.	Percentage of eggs lost per year in survivors	Calculation	Calculation	Calculation	Calculation	Input data
16.	Number of eggs per hen per year	Calculation	Calculation	Calculation	Calculation	Input data
17.	Price of eggs	Calculation	Calculation	Calculation	Calculation	Input data
18.	Value of eggs lost	Calculation	Calculation	Calculation	Calculation	Input data
19.	Total value of foregone production	Calculation	Calculation	Calculation	Calculation	Input data

Table S6. Poultry population (2020 estimates)

Nigerian States	Population (Number)		Proportion of production system (absolute numbers)					
	Indigenous chicken	Improved or exotic breeds	Indigenous chicken			Commercial exotic breeds		
			TOTAL (2020 Estimation)	Free-range (extensive)	Backyard (improved free range/semi intensive)	Small scale	Medium scale	Large scale
Abia	305,083	1,220,332	1,525,415	122,033	183,050	610,166	366,100	244,066
Anambra	1,034,471	3,855,755	4,702,140	362,065	672,406	2,313,453	771,151	771,151
Ebonyi	1,817,232	5,451,697	7,268,929	454,308	1,362,924	2,180,679	1,908,094	1,362,924
Enugu	1,669,065	4,750,416	6,419,481	500,720	1,168,346	1,662,646	1,662,646	1,425,125
Imo	3,856,213	7,161,538	11,017,751	578,432	3,277,781	4,296,923	1,790,385	1,074,231
Akwa-Ibom	356,985	3,212,861	3,569,845	160,643	196,341	1,124,501	1,606,430	481,929
Bayelsa	NA	NA	NA	NA	NA	NA	NA	NA
Cross-river	454,998	2,578,325	3,033,323	81,900	373,099	1,675,911	644,581	257,832
Edo	1,278,678	3,836,033	5,114,710	191,802	1,086,876	1,726,215	1,342,611	767,207
Delta	375,945	2,130,358	2,506,303	37,595	338,351	894,750	809,536	426,072
Rivers	200,504	2,305,799	2,506,303	26,066	174,439	922,320	830,088	553,392
Ekiti	40,360	94,174	134,534	20,180	20,180	58,388	23,543	12,243
Ogun	826,583	7,439,243	8,265,825	289,304	537,279	1,859,811	3,719,621	1,859,811
Ondo	231,695	1,312,937	1,544,632	69,508	162,186	590,822	459,528	262,587
Osun	492,788	2,792,465	3,285,253	123,197	369,591	1,256,609	837,740	698,116
Oyo	1,755,681	11,749,556	13,505,237	438,920	1,316,761	1,762,433	5,287,300	4,699,822
Lagos	320,912	6,097,330	6,418,242	25,673	295,239	1,219,466	2,743,798	2,134,065
Kogi	3,127,220	7,296,847	10,424,067	1,407,249	1,719,971	3,648,423	2,189,054	1,459,369
Niger	4,486,550	6,729,825	11,216,375	1,570,293	2,916,258	4,037,895	1,682,456	1,009,474
Nasarawa	856,702	3,426,810	4,283,512	214,176	642,527	1,370,724	1,199,383	856,702
Kwara	444,434	2,518,460	2,962,894	186,662	257,772	1,259,230	856,276	402,954
Benue	776,960	2,754,677	3,531,637	388,480	388,480	1,239,605	826,403	688,669
Plateau	3,183,027	6,462,508	9,645,535	732,096	2,450,930	1,874,127	3,231,254	1,357,127
Taraba	3,058,112	4,783,202	7,841,314	1,070,339	1,987,773	2,152,441	2,152,441	478,320
Borno	1,279,846	689,148	1,968,994	255,969	1,023,877	379,031	254,985	55,132
Adamawa	329,483	128,132	457,615	82,371	247,112	76,879	44,846	6,407
Bauchi	2,522,631	3,483,633	6,006,264	605,431	1,917,199	1,567,635	1,393,453	522,545
Gombe	2,940,029	1,960,020	4,900,049	940,809	1,999,220	862,409	784,008	313,603
Yobe	5,546,533	4,538,072	10,084,605	831,980	4,714,553	1,951,371	2,223,655	363,046
F.C.T, Abuja	681,459	2,044,376	2,725,834	68,146	613,313	1,226,625	449,763	367,988
Jigawa	3,567,244	4,359,964	7,927,208	1,605,260	1,961,984	1,743,986	1,525,988	1,089,991
Kaduna	3,546,760	5,320,140	8,866,900	851,222	2,695,538	2,394,063	1,596,042	1,330,035
Kano	4,947,357	9,603,693	14,551,050	1,583,154	3,364,203	2,881,108	3,841,477	2,881,108
Katsina	4,458,271	5,448,998	9,907,269	1,783,308	2,674,963	1,907,149	2,724,499	817,350
Kebbi	3,964,624	3,964,624	7,929,248	1,585,850	2,378,774	991,156	2,061,604	911,864
Sokoto	2,575,968	3,557,289	6,133,257	901,589	1,674,379	1,387,343	1,600,780	569,166
Zamfara	4,858,063	7,287,095	12,145,158	1,943,225	2,914,838	4,007,902	1,821,774	1,457,419
Total	72,168,465	152,346,328	224,326,708	22,089,954	50,078,511	61,114,194	57,263,294	33,968,841
Percentage	32.17	67.91	100	9.85	22.32	27.24	25.53	15.14

Source: Federal Ministry of Agriculture and Rural Development (2020)

Table S7. Human populations estimates for the year 2006, 2020 and 2022

STATE	Geopolitical Zones	No of LGAs	Population 2006	Growth Rate	Males2006	Females2006	Population 2022
Abia	SEZ	17	2,833,999	2.7	1,434,193	1,399,806	4,340,370
Adamawa	NEZ	21	3,168,101	2.9	1,606,123	1,561,978	5,005,472
Akwa Ibom	SSZ	31	3,920,208	3.4	2,044,510	1,875,698	6,693,261
Anambra	SEZ	21	4,182,032	2.8	2,174,641	2,007,391	6,505,448
Bauchi	NEZ	20	4,676,465	3.4	2,426,215	2,250,250	7,984,474
Bayelsa	SSZ	8	1,703,358	2.9	902,648	800,710	2,691,237
Benue	NCZ	23	4,219,244	3.0	2,164,058	2,055,186	6,770,648
Borno	NEZ	27	4,151,193	3.4	2,161,157	1,990,036	7,087,638
Cross River	SSZ	18	2,888,966	2.9	1,492,465	1,396,501	4,564,450
Delta	SSZ	25	4,098,391	3.2	2,074,306	2,024,085	6,784,042
Ebonyi	SEZ	13	2,173,501	2.8	1,040,984	1,132,517	3,381,035
Edo	SSZ	18	3,218,332	2.7	1,640,461	1,577,871	4,928,990
Ekiti	SWZ	16	2,384,212	3.1	1,212,609	1,171,603	3,885,827
Enugu	SEZ	17	3,257,298	3.0	1,624,202	1,633,096	5,227,007
FCT	NCZ	6	1,405,201	9.3	740,489	664,712	5,829,899
Gombe	NEZ	11	2,353,879	3.2	1,230,722	1,123,157	3,896,362
Imo	SEZ	27	3,934,899	3.2	2,032,286	1,902,613	6,513,415
Jigawa	NWZ	27	4,348,649	2.9	2,215,907	2,132,742	6,870,690
Kaduna	NWZ	23	6,066,562	3.0	3,112,028	2,954,534	9,735,051
Kano	NWZ	44	9,383,682	3.3	4,844,128	4,539,554	15,775,329
Katsina	NWZ	34	5,792,578	3.0	2,978,682	2,813,896	9,295,387
Kebbi	NWZ	21	3,238,628	3.1	1,617,498	1,621,130	5,278,369
Kogi	NCZ	21	3,278,487	3.0	1,691,737	1,586,750	5,261,009
Kwara	NCZ	16	2,371,089	3.0	1,220,581	1,150,508	3,804,902
Lagos	SWZ	20	9,013,534	3.2	4,678,020	4,335,514	14,920,049
Nasarawa	NCZ	13	1,863,275	3.0	945,556	917,719	2,990,009
Niger	NCZ	25	3,950,249	3.4	2,032,725	1,917,524	6,744,552
Ogun	SWZ	20	3,728,098	3.3	1,847,243	1,880,855	6,267,473
Ondo	SWZ	18	3,441,024	3.0	1,761,263	1,679,761	5,521,833
Osun	SWZ	30	3,423,535	3.2	1,740,619	1,682,916	5,666,957
Oyo	SWZ	33	5,591,589	3.4	2,809,840	2,781,749	9,546,933
Plateau	NCZ	17	3,178,712	2.7	1,593,033	1,585,679	4,868,311
Rivers	SSZ	23	5,185,400	3.4	2,710,665	2,474,735	8,853,416
Sokoto	NWZ	23	3,696,999	3.0	1,872,069	1,824,930	5,932,598
Taraba	NEZ	16	2,280,483	2.9	1,189,463	1,091,020	3,603,071
Yobe	NEZ	17	2,321,591	3.5	1,206,003	1,115,588	4,025,606
Zamfara	NWZ	14	3,259,846	3.2	1,630,344	1,629,502	5,396,004
Grand Total		774	139,983,289	3.2	71,699,473	68,283,816	232,447,125

The total mid-year estimates for 2020 human population in Nigeria was 208,327,405. There was no disaggregation by the subnational system (States). Source: United Nations, Department of Economic and Social Affairs, Population Division (2022). World Population Prospects 2022, Online Edition, [https://population.un.org/wpp/Download/Files/1_Indicators%20\(Standard\)/EXCEL_FILES/1_General/WPP2022_GEN_F01_DEMOGRAPHIC_INDICATORS_REV1.xlsx](https://population.un.org/wpp/Download/Files/1_Indicators%20(Standard)/EXCEL_FILES/1_General/WPP2022_GEN_F01_DEMOGRAPHIC_INDICATORS_REV1.xlsx).

Online link to Google form for data collection: <https://docs.google.com/forms/d/e/1FAIpQLSefH1i8YASvewU1y1x-OS0sgyuvWJnOuaECXKH9ReLV4YaYZw/viewform?vc=0&c=0&w=1&flr=0>



Data brief in
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Evaluation sheet