

The Economic Impact of Brucellosis on the Trade of Live Animals and Meat for the Mediterranean Countries

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Date of Submission: 10-07-2023

Date of Acceptance: 20-07-2023

ABSTRACT

Malta fever, or Mediterranean fever, commonly known as brucellosis, is a transboundary animal disease that is geographically concentrated in the Mediterranean region. It infects humans and live animals, and causes great economic losses. In addition, the disease is a major obstacle to international trade, especially trade in agricultural products such as live animals and red meat. The disease is mainly concentrated in countries (Egypt, Libya, Tunisia, Algeria, Turkey, Greece, Syria, Lebanon and Palestine), and Egypt is among the African countries most affected by the disease during the disease endemic period (2008-2020), as the average value of Egypt's imports of live animals increased by about \$23.2 million. And the average value of imports of red meat increased by about \$1.106 billion, statistically significant ($P < 0.01$ for meat.). On the other hand, during the time when *Brucella* was endemic in the Mediterranean region, but also in Turkey in Europe, the disease increased the average value of Turkey's imports of live animals by about \$0.425 billion (2008-2020 not only this, but during the same During the time period, the average red meat import value increased by about 116.7 million at a statistically significant level ($P < 0.01$, $P < 0.05$).

Keywords: agricultural trade, Transboundary animal diseases, Mediterranean diseases
The effects of brucellosis.

I. INTRODUCTION

Transboundary animal diseases (TADS) are diseases that spread quickly between animals, and Mediterranean fever, or brucellosis, is one of the infectious diseases and one of the most interesting diseases in the Mediterranean region (Gwidat et al., 2015), It is the world's second most important zoonotic disease after rabies and causes significant losses in animal products (Nicoletti 2010– Rossetti et al., 2017). Cattle, pigs, sheep, goats, camels, and dogs are all affected by the

disease. Other ruminants and marine mammals may be affected as well. Brucellosis is also known as brucellosis, brucellosis, brucellosis, epidemic abortion, infectious abortion, and Bang's disease (Gwidat et al., 2010-Abubakar et al., 2012). Brucellosis is a highly contagious zoonotic disease that affects humans, and the disease impedes the trade of live animals and their products in these countries (Smits et al., 2004-Benkiran 2006- Addis et al., 2018), affecting the country's balance of payments and GDP, particularly meat of all types, whether exported or imported. The disease is also known as infectious abortion disease (Food and Agriculture Organization 2015- World Organization for Animal Health 2015). It is worth noting that the disease caused losses totaling more than \$ 3.4 billion globally between 2001 and 2020, with Egypt's losses accounting for only about \$ 9.8 million (Dadar et al., 2021) (Food and Agriculture Organization, 2020 and World Organization for Animal Health, 2020).

II. MATERIAL AND METHODS

Study Area

The study was conducted in the Mediterranean region, where the disease is concentrated in many countries in North Africa, southern Europe, and some Asian countries. Egypt and Turkey were chosen for the study because they are the most important countries in which the disease is endemic and the most affected in the trade of agricultural animal products during the period (2001-2020).

Study Design and Sampling.

For the experiences and data obtained by analyzing them using the program (SPSS v16.0). Where the quantitative analysis was used, through simple and multiple linear regression equations, to discover the values of T-square, R, and F, also the dummy variable was used to measure the effect of the disease on the volume of trade, and the t-test

was used for two independent samples, in order to show the effect of the disease on the value of Trade through the difference between the averages of the two study periods.

III. RESULTS

The most important countries in the world were affected by brucellosis during the period (2001-2020), which is the period of the emergence of the disease according to the classification of the World Organization for Animal Health (Table 1). The disease is spreading in many countries of the African continent, such as Egypt, Libya, Tunisia, Algeria, and Uganda. From the Asian continent, Syria, Oman, Kuwait, Iraq, Lebanon, Saudi Arabia, Iran, Russia, and Thailand (Gwida et al., 2010), on the other hand, the presence of brucellosis in Turkey, Albania, Portugal, Greece and Macedonia from the European continent. as well as in Argentina from Latin America (Refai 2002), (times of disease, OIE 2020).

Geographical concentration of brucellosis in the Mediterranean region, and the world.

Geographical concentration of brucellosis in the Mediterranean region (Figure 1 and Table 2) (Disease Times, OIE 2020). Among the most important of these countries are Egypt, Algeria, Tunisia, Libya, Syria, Lebanon, Palestine, Albania, Turkey (Gwida et al., 2010) and Greece (Can et al., 2014), and The endemicity of brucellosis lasted from 6 to 16 years, and from Asia, the countries of Iraq, Saudi Arabia, Oman and Jordan Iran, Kuwait, Thailand, and Russia (Muslim et al., 2015 - Lyndall-Mena 2016), and the prevalence of brucellosis in these countries lasted from 12-16 years (Perez et al., 2015), and other countries such as Portugal, Macedonia, Argentina, and Uganda, The prevalence of brucellosis in these countries lasted from 11 to 16 years (B Lopes et al., 2010- Gwida et al., 2010).

Table 1. The times of occurrence and spread of brucellosis in the most important countries of the world according to the classification of the World Organization for Animal Health during the period (2001-2020).

Country	2001	2002-2005	2006	2007	2008	2009	2010-2013	2014	2015	2016-2018	2019	2020
Egypt	+	--	+	++	++	+	+	+	+	+	+	+
Algeria	+	--	++	++	++	+	+	+	+	+	+	+
Albania	--	--	++	++	++	+	+	+	+	+	+	+
Uganda	--	--	++	++	++	++	++	++	++	++	++	++
Syrian	+	--	++	+	++	+	+	+	+	+	+	+
Tunisia	--	--	++	++	++	+	+	+	+	+	+	+
Amman	--	--	++	++	++	+	+	+	+	+	+	+
Kuwait	+	--	--	+	++	+	+	+	+	+	+	+
Libya	--	--	+	+	+	++	+	--	--	--	+	--
Lebanon	--	--	++	++	++	+	--	--	--	--	--	--
Iraq	+	--	++	++	++	+	+	+	+	+	+	+
Saudi Arabia	--	--	++	++	++	+	+	+	+	+	+	+
Iran	--	--	++	+	++	+	+	+	+	+	+	+
Russia	+	--	++	++	++	+	+	+	+	+	+	+
Turkey	--	--	++	++	++	+	+	+	+	+	+	+
Portugal	--	--	++	++	++	+	+	+	+	+	+	+
Greece	+	--	++	++	++	+	+	+	--	+	+	--
Macedonia	--	--	++	++	++	+	++	++	++	++	++	++

Argentina	--	--	++	++	++	+	+	+	+	+	+	+
Thailand	--	+	++	++	++	+	+	+	+	+	+	+

Source: -www.oie.org, (times of disease, 2020).

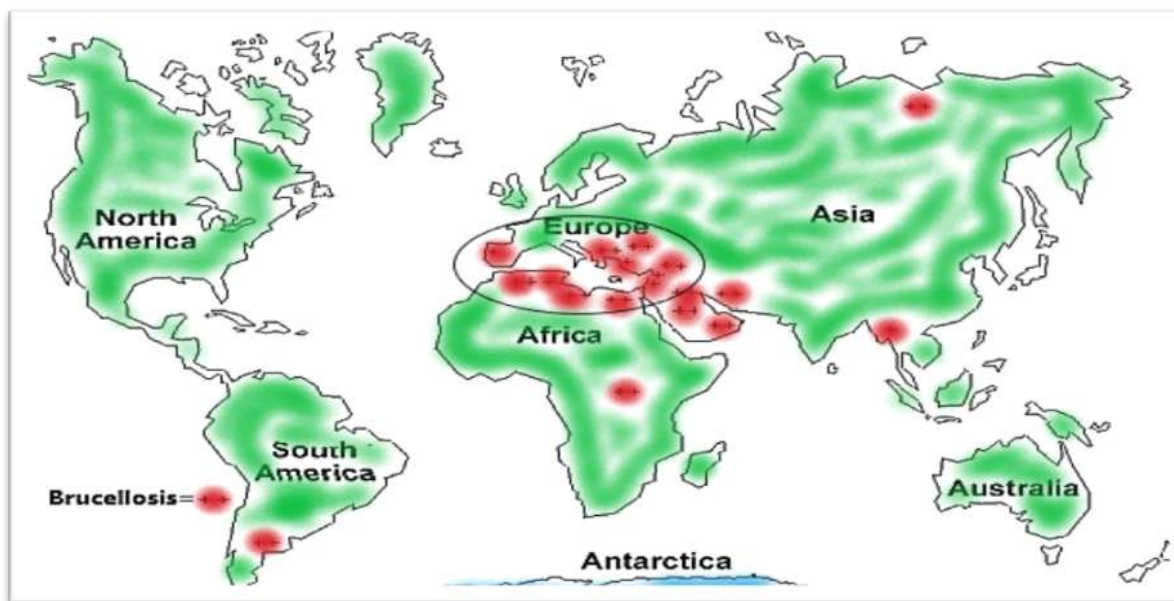
- (-) Disease does not exist. (+) The disease does exist. (++) The disease is widespread.

The economic impact of brucellosis in the Mediterranean region.

In this part, we address the main purpose of this paper, which is to know the economic impact of brucellosis on the trade of animal products (red meat, live animals), in the Mediterranean region, where the disease is endemic. (Yasmineet al., 2015- Rossetti et al., 2017), specifically the impact of the disease in Egypt and Turkey (Samaha et al., 2009) (Hussein et al., 2018) (Samaha et al., 2008), by examining the effect of The spread of the disease on

agricultural trade on the one hand, and on the other hand, the impact of the disease on the trade of red meat and live animals during the period (2001-2020).

To measure the effect, the study was divided into two periods, called the first period before the spread of brucellosis, which is the pre-endemic period (1995-2007), and the second period after the spread of brucellosis, which is called the endemic period (2008-2020)(times of disease, OIE 2020 -Wareth et al., 2014).



Source: World Organization for Animal Health, (WWW.OIE.org, times of disease, 2020).

-Red = Brucella outbreak areas.

Figure 1.The most important areas of the outbreak of brucellosis in the world.

Table 2.The most important areas and timing of the presence of brucellosis during the period (2001 - 2020).

BRUCELOSIS	Region	Total number of countries	The number of years	Mediterranean countries
	TheMediterranean Sea	11	3-16	Egypt , Algeria, Tunisia, Syria,
	Africa	1	12	Libya, Turkey,
	Asia	7	12-16	Lebanon ,
	Europe	2	11-16	Albania, Turkey,
	South america	1	12	Greece Palestine

Source: World Organization for Animal Health, www.oie.org, times of disease, 2020).

An overview of Egypt's foreign agricultural trade during periods of brucellosis:

-Total Agricultural Imports

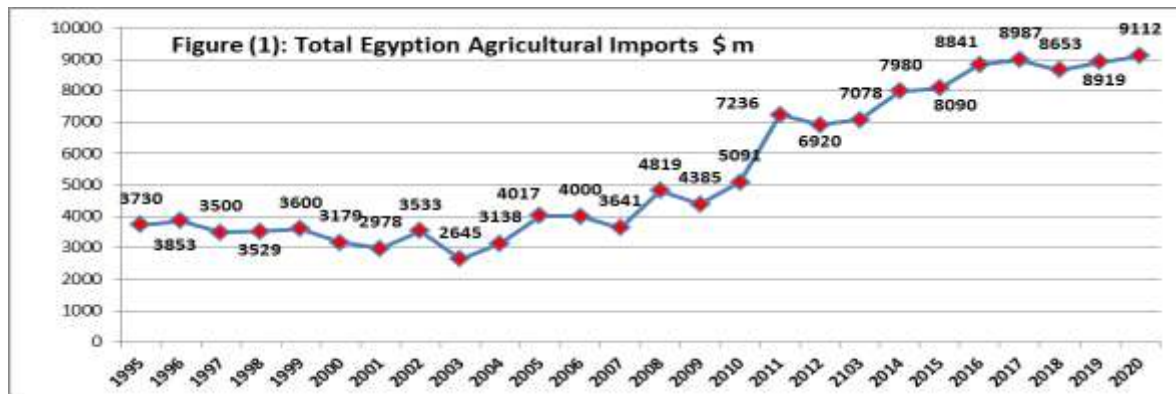
A - Pre-endemic period:

Table 3.shows the total value of Egyptian agricultural imports during the study period (1995-2020) (FAOSTAT, 2020). And by estimating the simple linear regression equation that reflects the evolution of the value of Egyptian agricultural imports in the pre-endemic period of brucellosis (1995-2007) shown in (Table 4 and Figure 2) (FAOSTAT, 2020), it was found that the total value of Egyptian agricultural imports decreases by

about 2.53 million dollars annually, the model was not statistically significant.

b- The period of endemicity of the disease:

On the other hand, by estimating the simple linear regression equation during the endemic period of the disease (2008-2020) in (Table 4) (FAOSTAT, 2020), it was found that there was an increase in the total value of the disease, and the value of agricultural imports is estimated at about \$399.91 million annually , statistically significant(F= 70.319 , P<0.01).



Source: Table 3.

Figure 2.The total value of Egyptian agricultural imports (1995-2020).

Live Animal Imports

A - Pre-endemic period:

The evolution of the value of Egyptian imports of live animals during the pre-endemic period of brucellosis (1995-2007) (Tables 3, 4, and Figure 3) by calculating the simple linear regression equation (UN Organization, 2020 and FAOSTAT, 2020). The results showed that the expected annual value of live animal imports decreased by about 6.264 million dollars annually, statistically significant (F = 3.427 P < 0.01). It is important to note that during this period live animal imports accounted for 2.88% of the average agricultural imports..

b- The period of Endemicity of the disease:

By estimating the simple linear regression equation for the endemic period of brucellosis (2008-2020) (Table 4) (United Nations Organization, 2020 and FAOSTAT, 2020), the results show that there is an increase in the value of Egypt's imports of live animals by about \$13.97 million annually, was Statistically significant (F=63.624,P<0.01). It is worth noting that imports of live animals represented about 1.64% of the average agricultural imports during this period..

Table 3.The economic impact of brucellosis on the Egyptian foreign agricultural trade with the world during the period (1995-2020).

Period	spread	Years	Total agricultural imports (millions \$)	Live animals (\$ \$ m)	Percentage of live animal imports from agricultural imports %	Red meat (\$bn)	Percentage of red meat imports from agricultural imports (%)
	--	1995	3730	150	4.02	0.207	5.54
	--	1996	3853	79.7	2.02	0.169	4.39

Pre-endemic period	--	1997	3500	62.1	1.77	0.193	5.51
	--	1998	3529	73.7	2.09	0.221	6.26
	--	1999	3600	158	4.39	0.273	7.58
	--	2000	3179	168	5.28	0.282	8.87
	+	2001	2978	173	5.81	0.161	5.41
	--	2002	3533	109	3.08	0.226	6.39
	--	2003	2645	95.2	3.59	0.186	7.03
	--	2004	3138	65.2	2.07	0.198	6.31
	--	2005	4017	66.1	1.65	0.318	7.92
	+	2006	4000	28.4	0.71	0.496	12.4
	++	2007	3641	35.1	0.96	0.582	15.9
		Average period	3488	97.2	2.88	0.271	7.65
Endemic period	+	2008	4819	26.1	0.54	0.614	12.7
	+	2009	4385	60.6	0.38	0.577	13.2
	+	2010	5091	85.5	3.77	1.001	19.7
	+	2011	7236	80.2	1.11	0.947	13.1
	++	2012	6920	70.3	1.02	1.401	20.2
	++	2103	7078	72.1	1.03	1.203	16.9
	+	2014	7980	134	1.68	1.601	20.1
	+	2015	8090	165	2.04	2.001	24.7
	++	2016	8841	140	1.58	1.411	15.9
	+	2017	8987	138	1.54	1.607	17.9
	++	2018	8653	219	2.53	1.711	19.7
	++	2019	8919	181	2.03	2.101	23.5
	+	2020 Average period	9112 7393	193 120.4	2.13 1.64	1.722 1.377	18.8 18.2
	...	Overall average	5441	108.8	2.26	0.823	12.9

Source: www.oie.org. , (times of disease, 2020).

-United Nations Organization,2020 .www.comtrade.UN.org.

- FAOSTAT, 2020. www.fao.org.

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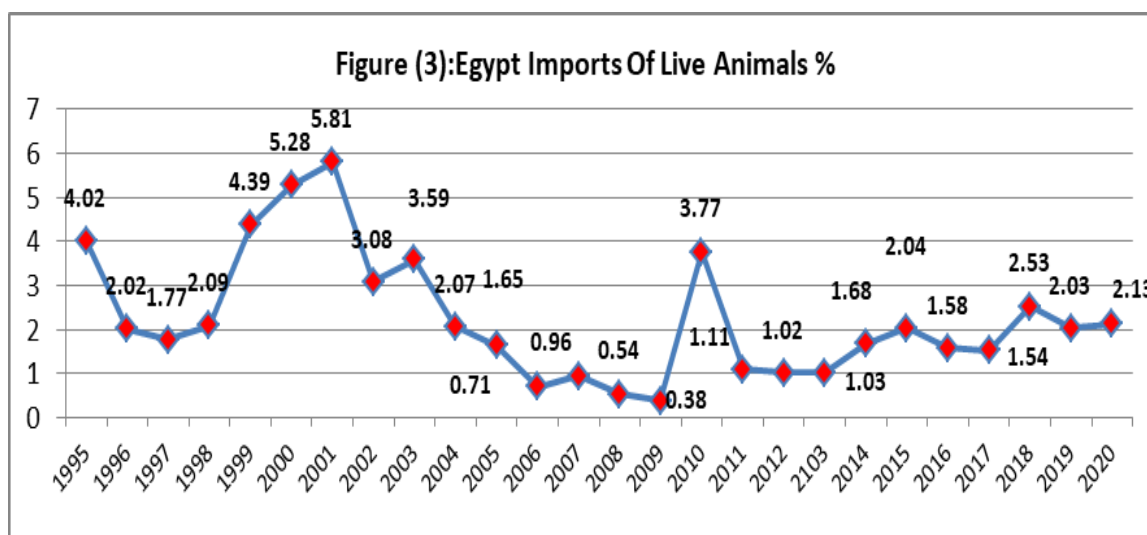
Table 4.Linear regression equations for the development of total Egyptian agricultural imports during the pre-endemic period (1995-2007) and the disease endemic period (2008-2020).

variable	Period	The equation	R ²	F	the annual rate of change%
Total agricultural	Pre-endemicity (1995-2007)	$\hat{y} = 3505.62 - 2.53X_1$ (-0.081)	0.001	0.007	-0.07

imports (\$ m)	Endemicity (2008- 2020)	$\hat{y} = 4593.81 + 399.91X_1$ (8.386) **	0.865	70.319**	5.41
Live animals (\$ m)	Pre-endemicity (1995-2007)	$\hat{y} = 141.04 - 6.264X_1$ (-1.851) *	0.238	3.427**	-6.44
	Endemicity (2008- 2020)	$\hat{y} = 22.56 + 13.97X_1$ (7.976) **	0.853	63.624**	11.6
Red meat (\$ bn)	Pre-endemicity (1995-2007)	$\hat{y} = 0.113 + 0.022X_1$ (3.061) **	0.460	9.369**	8.12
	Endemicity (2008- 2020)	$\hat{y} = 0.611 + 0.109X_1$ (6.068) **	0.865	36.818**	7.92

Source: calculated from Table 3.

\hat{y} is the estimated value of the dependent variable . X_1 : time element = (1. 2.3.. ..)(*) Significant at the.05 level ,(**) Significant at the.01 level , The numbers in parentheses refer to the calculated (t) value.



Source: Table 3.

Figure 3. The share of Live Animal imports from Egyptian agricultural imports (%) (1995 - 2020).

Imports of Red meat

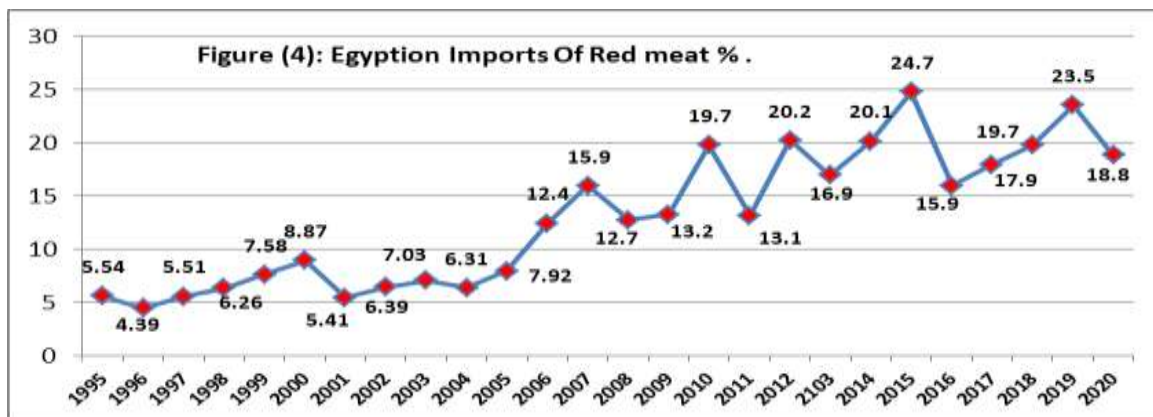
A - Pre-endemic period:

The estimated value of a simple linear regression equation, which represents changes in the value of Egyptian imports of red meat during the pre-endemic period of brucellosis, is displayed (in Tables 3, 4, and Figure 4). (1995-2007). (Organisation for the United Nations,2020 and FAOSTAT, 2020). It was shown that the annual rise in the value of red meat imports was roughly 0.022 billion dollars, with a statistical significance of (F=9.369, P<0.01). It is significant to note that

throughout this time, imports of red meat made up 7.65% of all agricultural imports..

b- The period of Endemicity of the disease:

By estimating the simple linear regression equation (Table 4) (United Nations Organization, 2020 and FAOSTAT, 2020) during the period of Brucellaendemicity (2008-2020), it was discovered that the value of red meat imports to Egypt increased by about \$0.109 billion annually. Significant statistically (F=36.318, P<0.01). During this time period, red meat imports accounted for 18.2% of total agricultural imports.



Source: Table No 3.

Figure 4. The share of red meat imports from Egyptian agricultural imports(%) (1995 - 2020).

An overview of the foreign trade of agricultural products in Turkey during periods of brucellosis.

- Total Agricultural Imports

A - Pre-endemic period:

The total value of Turkish agricultural imports from (1995– 2020) is shown in (Table 5) (United Nations Organization, 2020 and FAOSTAT, 2020). The results of estimating the simple linear regression equation, which reflects the evolution of the value of Turkish agricultural imports during the pre-endemic period of brucellosis (1995-2007) (Table 6 and Figure 5), showed a decrease in the total value of agricultural

imports by about \$0.023 billion annually, and the statistical significance of the model was not proven.

b- The period of Endemicity of the disease:

The results showed that the total value of Turkish agricultural imports decreased by about \$0.031 billion annually during the disease-endemic period (2008-2020) (Table 6) (United Nations Organization, 2020 and FAOSTAT, 2020). This has been statistically demonstrated($F=5.232, P<0.01$) (Burrell et al., 2005 -Yumuket al., 2012).

Table 5. The economic impact of brucellosis on the Turkish foreign agricultural trade with the world during the period (1995-2020).

Period	spread	The year's	Total agricultural imports \$bn	Live animals \$bn	Percentage of animal live imports from agricultural imports %	Red meat (\$m)	Percentage of red meat imports from agricultural imports %
Pre-endemic period	--	1995	2.52	0.343	13.6	77.1	3.06
	--	1996	3.33	0.166	4.98	25.1	0.75
	--	1997	3.34	0.189	5.66	1.01	0.03
	--	1998	2.83	0.261	9.22	0.49	0.02
	--	1999	3.15	0.236	7.49	1.01	0.03
	--	2000	2.67	0.335	12.5	0.32	0.01
	--	2001	3.05	0.228	7.48	0.51	0.02
	--	2002	2.27	0.159	7.01	0.18	0.01
	+	2003	2.46	0.153	6.21	0.28	0.01
	--	2004	2.84	0.156	5.49	0.23	0.02
	--	2005	2.69	0.158	5.87	0.28	0.01

	++	2006	2.59	0.155	5.98	0.86	0.04
	++	2007	3.16	0.239	7.56	0.97	0.03
		Average period	2.84	0.214	7.62	8.33	0.31
Endemic period	++	2008	3.09	0.414	13.4	0.91	0.03
	+	2009	3.11	0.337	10.8	1.61	0.03
	+	2010	2.64	0.333	12.6	250	9.51
	+	2011	2.78	1.001	36.1	514	18.5
	+	2012	2.89	0.852	29.5	97.2	3.36
	+	2103	2.69	0.346	12.9	25.3	0.93
	+	2014	2.34	0.141	6.03	6.41	0.26
	+	2015	2.89	0.323	11.2	107	3.70
	+	2016	2.58	0.604	23.4	42.1	1.62
	+	2017	2.66	1.002	37.7	87.4	3.27
	+	2018	2.63	1.801	2.53	323	12.2
	+	2019	2.76	0.701	2.03	87.7	31.8
		+	2020 Average period	2.57 2.74	0.445 0.639	2.13 15.41	74.3 124
	...	Overall average	2.79	0.426	11.5	66.3	4.35

Source:www.oie.org(times of disease, 2020).

-United Nations Organization,2020. www.comtrade.UN.org.

- FAOSTAT, 2020. www.fao.org.

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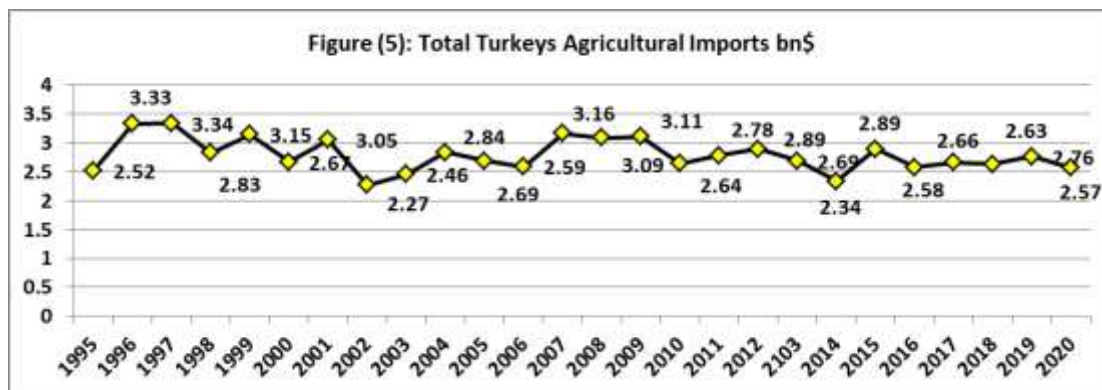
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Table 6.Linear regression equations for the development of total Turkish agricultural imports during the pre-endemic period (1995-2007) and the endemic period (2008-2020).

Variable	Period	The equation	R ²	F	Annual rate of change%
Total agricultural imports (\$ bn)	Pre-endemicity (1995-2007)	$\hat{y} = 3.00 - 0.023X_1$ (-0.901)	0.069	0.811	-0.81
	Endemicity (2008- 2020)	$\hat{y} = 2.96 - 0.031X_1$ (-2.287)6*	0.322	5.232**	-1.13
Live animals (\$ bn)	Pre-endemicity (1995-2007)	$\hat{y} = 0.27 - 0.008X_1$ (-1.736)	0.215	3.014**	-3.74
	Endemicity (2008- 2020)	$\hat{y} = 0.355 + 0.040X_1$ (1.257)	0.126	1.581	6.26
Red meat (\$ m)	Pre-endemicity (1995-2007)	$\hat{y} = 30.77 - 3.205 X_1$ (-2.324) *	0.329	5.402**	-38.5
	Endemicity (2008- 2020)	$\hat{y} = 129.98 - 0.800X_1$ (-0.068) **	0.021	0.005	-0.64

-Source: calculated from Table .5

\hat{y} 's is the estimated value of the dependent variable . X_1 : time element = (1. 2.3.. ..)(*) Significant at the.05 level ,(**) Significant at the.01 level , The numbers in parentheses refer to the calculated (t) value.



-Source: Table 5.

Figure 5. Total Turkish Agricultural Imports (1995 - 2020).

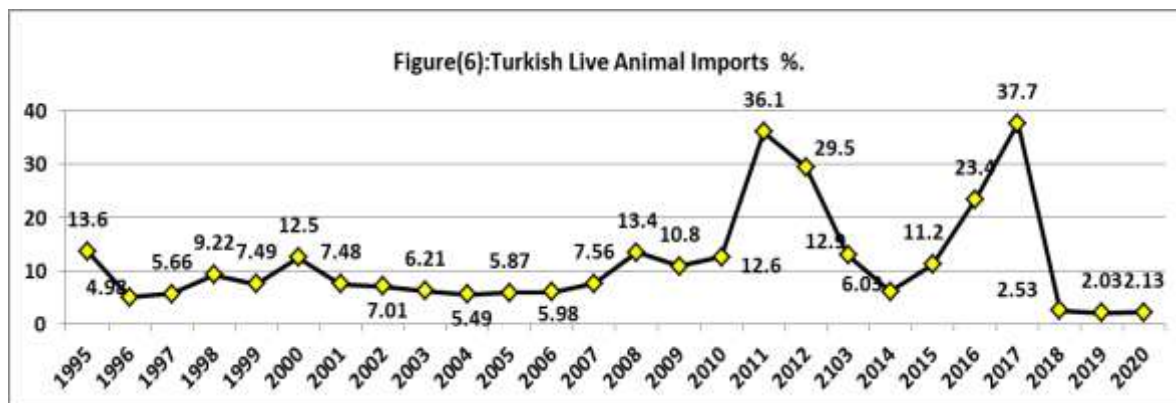
- Import of Live animals

A - Pre-endemic period:

Tables 5, 6 and Figure 6 provide an estimate of a simple linear regression equation that depicts the evolution of the value of Turkish imports of live animals during the pre-endemic period of brucellosis (1995-2007). (United Nations Organization, 2020 and FAOSTAT, 2020). The results showed a decrease in the value of live animal imports by about 0.008 billion dollars annually, and this was proven statistically ($F=3.014, P<0.01$), and that it constituted 7.62% of the average total agricultural imports during this period.

b- The period of Endemicity of the disease:

By estimating the simple linear regression equation for the disease endemic period (2008-2020) (Table 6) (United Nations Organization, 2020 and FAOSTAT, 2020), the results showed an increase in the value of Turkey's imports of live animals estimated at about \$0.040 billion annually. However, the model was not statistically significant, and live animal imports accounted for 15.4% of all the average total agricultural imports during this period.



-Source: Table 5.

Figure 6. The share of Live Animal imports from Turkish agricultural imports (%) (1995 - 2020).

-Red meat imports

A - Pre-endemic period:

Tables 5, 6 and Figure 7 show the estimation of the simple linear regression equation, which reflects the evolution of the value of Turkish red meat imports during the pre-endemic period of brucellosis (1995-2007). (United Nations Organization, 2020 and FAOSTAT, 2020). The results showed a decrease in the value of red meat

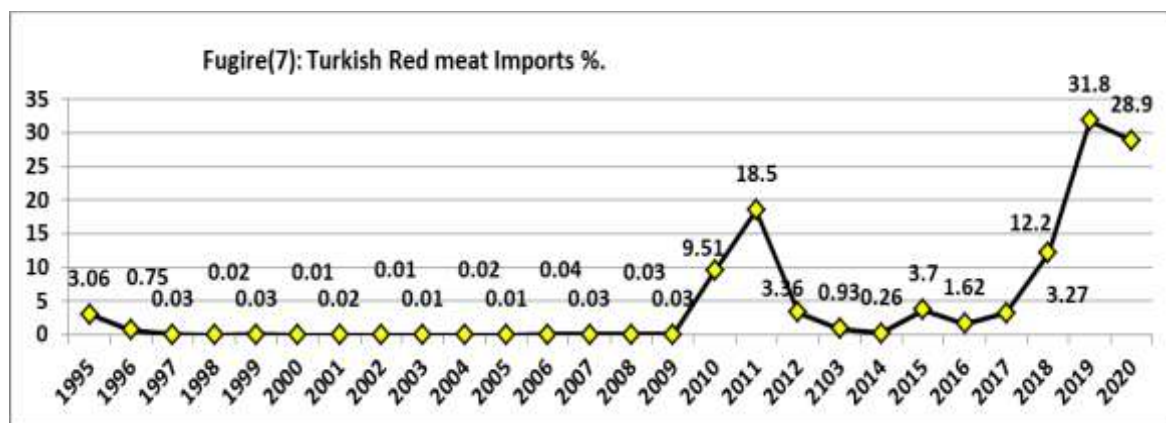
imports by about \$3.205 million annually, with statistical significance ($F=5.402, P<0.01$), and red meat imports represented 0.31% of the average agricultural imports during this period.

b- The period of endemicity of the disease:

By estimating the simple linear regression equation (Table 6) (United Nations Organization,

2020 and FAO STAT, 2020) during the brucellosis endemic period (2008-2020), the results showed that the value of Turkey's red meat imports decreased by about 0.800 million dollars annually,

though its statistical significance was not proven, and red meat imports represented 8.72% of the average agricultural imports during this period.



-Source: Table 5.

Figure 7. The share of Red Meat imports from Turkish agricultural imports (%) (1995 - 2020).

IV. DISCUSSION:

The economic impact of brucellosis on Egypt's imports of live animals and meat.

By comparing the average value of total agricultural imports in the pre-endemic period of brucellosis (1995-2007) and the endemic period (2008-2020) (Table 3) using the t-test for the difference between the two averages (Posten 1978-Cressieet al., 1986) As shown (Table 7), the results showed that there is a significant difference of about \$3,905 million ($t=7.740, P<0.01$).between the averages during the two periods, in favor of the disease endemic period.

On other hand, the results showed, using the (t) test, that there was a difference between the average value of Egyptian imports of live animals, estimated at about \$23.2 million, in favor of the endemic period of the disease. It was not statistically significant. Additionally, (Table 7) findings revealed a statistically significant difference ($T=9.232, P<0.01$) in favor of the second study period, the period of endemic disease. between the average value of red meat imports of all types between the two study periods, which is estimated to be about 1.106 billion dollars. This demonstrates the detrimental effects of endemic brucellosis, which were reflected in the rise in of agricultural imports and products into Egypt.

Table 7. The economic impact of brucellosis on Egyptian foreign trade through the t-test for the significance of the differences between the averages before and after endemicity of the disease during the two periods (1995-2007) and (2008-2020).

Item	variable	Pre-endemic average	Average period of endemicity	The difference between the two Averages	(t) Estimated	The effect
Agricultural trade (\$ m)	The value of Agricultural imports	3488	7393	3905	7.740**	Negative Effect
	Imports of Live animals	97.2	120.4	23.2	0.874
	Imports of Red meat (\$ bn)	0.271	1.377	1.106	9.232**	Negative Effect

Source: Table 3.

(*) Significant at the.05 level ,(**) Significant at the.01 level.

The economic impact of brucellosis on Turkey's imports of live animals and meat.

Comparison of the average value of total Turkish agricultural imports in the pre-endemic period of brucellosis (1995-2007) and the endemic period (2008-2020) as shown in (Table 5), using the (t) test for the difference between the two averages as shown in (Table 8), (Brockhoff 2003) (Cressie et al., 1986) (Posten 1978), the results show that there are differences between the two study periods estimated at about 0.0977 billion dollars, not statistically supported.

On other hand, the results of (Table 8) revealed, There are differences between the

average value of Turkish live animal imports at about \$0.425 billion, statistically significant (t = 3.271, P < 0.01), in favor of the second period, which is the endemic period of brucellosis .In terms of Turkish red meat imports, the same table revealed statistically significant differences, between the average value of imports in favor of the second period, the period in which the disease is endemic, by about \$116.1 million ,statistically significant (t=2.626 ,P<0.05) Based on the foregoing, it was found that the disease had a negative impact, as the value of agricultural imports of live animals and red meat to Turkey increased due to brucellosis.

Table 8.The economic impact of brucellosis on Turkish foreign trade by t-test for the significance of differences between the averages before and after endemicity during the two periods (1995-2007) and (2008-2020).

Item	Variable	Pre-endemic average	Average period of endemicity	The difference between the two Averages	(t) Estimated	The effect
Agricultural trade (\$ bn)	The value of Agricultural imports	2.839	2.741	0.0977	0.837	Positive effect
	Imports of Live animals	0.214	0.4639	0.425	3.271**	Negative effect
	Imports of Red meat (\$ m)	8.334	124.4	116.1	2.626*	Negative effect

Source: Table 5.

(*) Significant at the.05 level ,(**) Significant at the.01 level.

V. CONCLUSION

According to the findings, brucellosis is a transboundary animal disease that is geographically concentrated in the Mediterranean region, It is the most endemic area for brucellosis in the world. Egypt, Libya, Tunisia, Algeria, Greece, Turkey, Palestine, and Syria are among the most important Mediterranean countries affected by the disease (OIE, 2020). The disease is a barrier to agricultural trade and its products in the Mediterranean region, with Egypt and Turkey being among the most severely affected countries During the endemic period of the disease, Egypt's imports of live animals and red meat increased, as did Turkey's imports of live animals and red meat. This suggests that the disease had a significant negative impact on Mediterranean imports of agricultural

products, particularly livestock (live animals and red meat), during the study period (1995-2020).

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