Annals of "Dunarea de Jos" University of Galati
Fascicle I. Economics and Applied Informatics
Years XXXII – nº1/2026
ISSN-L 1584-0409 ISSN-Online 2344-441X
www.eia.feaa.ugal.ro

DOI https://doi.org/10.35219/eai15840409586

Statistical Trek in the Sphere of the Olive Oil Production, a Natural Remedy with Positive Effects on the People's Health and Well-Being

Gabriela Opaiț*

ARTICLE INFO

Article history:
Received April 07, 2026
Accepted April 26, 2026
Available online April 30, 2026

JEL Classification
C1, C12, C2

Keywords:
mediterranean diet, antioxidant, polyphenol, immune system, chemical free, natural remedy

ABSTRACT

The target of this statistical representation ticks as pivot the increase's reflection concerning the manufacture of olive oil between 2026-2030 at the worldwide level, in E.U. and in Spain. The extra virgin olive oil is one and only oil which incorporates a bigger weight in relative sizes concerning polyphenols, respectively antioxidants and he offers a unique property, namely chemical free.

1. Introduction

The present research looks for to reflect the forecasts for the manufacture of olive oil at the worldwide level, respectively in E.U. and alternatively in Spain which is the global leader in the achievement of the olive oil production. The extra virgin olive oil in a true elixir and a good friend for the people's health and well-being, because this offers a lot of benefits. If invariably the people consume extra virgin olive oil, they can observe improvements concerning the heart health, the presence of the anti-inflamatory properties, the decline of the origin's risk regarding the Alzheimer's disease, steps in the ameliorations concerning the diabetes's management and the weight's management, improvements in the area of the digestive health through the battle against of the bacteriums and a great aid in the protection against of the premature aging, respectively in the offensive versus of the damage created by the free radicals.

The great weight of the nourishing substances, bioactive molecules and antioxidants, such as vitamin E, confer on extra virgin oil „health springs" for the people's well-being and for these parameters he holds a higher standard of the quality awards by a lot points of view.

In the first step of this statistical travel, we can make acquaintance with the data's forecasts concerning the global levels for the manufacture of olive oil which will be achieved in the period 2026-2030. In the second level of this statistical trek, we can visualize the values's estimations regarding the manufacture of olive oil in E.U. between 2026-2030. In the third area of this statistical itinerary, we can meet the data's predictions for the manufacture of olive oil in Spain in the horizon of time 2026-2030.

For to achive the forecasts regarding the productions of the „natural remedy" named olive oil, we can apply the „Least Squares Method" which represents a „statistical machinery" in the identification of the pheneomenons's trends.

Johann Carl Friedrich Gauss created the appearance's possibility of the „Least Squares Method" which is the principal vector of the forecasts's implementation.

*Dunarea de Jos University of Galati, Romania. E-mail address: gabriela.opait@ugal.ro (G. Opait).

2. The „screening's scenography" of the data's tendency which indicates the global manufacture of olive oil in the period 2021-2025

Table 1 The „data's screenplay" for the global manufacture of olive oil between 2021-2025

YEARS	THE GLOBAL MANUFACTURE OF OLIVE OIL (thousands tons) (λ_i)
2021	**3020**
2022	**3415**
2023	**2760**
2024	**2589**
2025	**3572**

Source: www.Agri-Food Data Portal

- if the data's history concerning the ξ variable, where ξ = **the global manufacture of olive oil,** „inspires" a linear equation $\xi_{t_i} = a + b \cdot t_i$, than *a* and *b* will be [2]:

Table 2 The „data's screenplay" for the global manufacture of olive oil, if this shows a linear model

YEARS	THE GLOBAL MANUFACTURE OF OLIVE OIL (thousands tons) (ξ_i)	LINEAR TREND				
		t_i	t_i^2	$t_i\xi_i$	$\xi_{t_i} = a + bt_i$	$\lvert\xi_i - \xi_{t_i}\rvert$
2021	**3020**	-2	4	-6040	3015,6	4,4
2022	**3415**	-1	1	-3415	3043,4	371,6
2023	**2760**	0	0	0	3071,2	311,2
2024	**2589**	+1	1	+2589	3099,0	510,0
2025	**3572**	+2	4	+7144	3126,8	445,2
TOTAL	**15356**	0	10	278	15356	1642,4

$$a = \frac{\sum_{i=1}^{n}\xi_i \sum_{i=1}^{n}t_i^{\,2} - \sum_{i=1}^{n}\xi_i t_i \sum_{i=1}^{n}t_i}{n\sum_{i=1}^{n}t_i^{\,2} - \left(\sum_{i=1}^{n}t_i\right)^2} = \frac{15356 \cdot 10}{5 \cdot 10} = 3071{,}2 \quad b = \frac{n\sum_{i=1}^{n}\xi_i t_i - \sum_{i=1}^{n}t_i \sum_{i=1}^{n}\xi_i}{n\sum_{i=1}^{n}t_i^{\,2} - \left(\sum_{i=1}^{n}t_i\right)^2} = \frac{5 \cdot 278}{5 \cdot 10} = 27{,}8$$

$$v_I = \left[\frac{\sum_{i=1}^{m}\left|\xi_i - \xi_{t_i}^{I}\right|}{n} : \frac{\sum_{i=1}^{m}\xi_i}{n}\right] \cdot 100 = \frac{\sum_{i=1}^{m}\left|\xi_i - \xi_{t_i}^{I}\right|}{\sum_{i=1}^{m}\xi_i} \cdot 100 = \frac{1642{,}4}{15356} \cdot 100 = 10{,}69\%$$

- if the data's history concerning the ξ variable, where ξ = **the global manufacture of olive oil,** „inspires" a quadratic equation $\xi_{t_i} = a + b \cdot t_i + ct_i^2$, than *a* and *b* will be [2]:

Table 3 The „data's screenplay" for the global manufacture of olive oil, if this shows a quadratic model

YEARS	THE GLOBAL MANUFACTURE OF OLIVE OIL (thousands tons (ξ_i)	PARABOLIC TREND					
		t_i	t_i^2	t_i^4	$t_i^2\xi_i$	$\xi_{t_i} = a + bt_i + ct_i^2$	$\lvert\xi_i - \xi_{t_i}\rvert$
2021	**3020**	-2	4	16	12080	3252,742857	232,7
2022	**3415**	-1	1	1	3415	2924,828572	490,2
2023	**2760**	0	0	0	0	2834,057143	74,1
2024	**2589**	+1	1	1	2589	2980,428572	391,4
2025	**3572**	+2	4	16	14288	3363,942857	208,1
TOTAL	**15356**	0	10	34	32372	15356	1396,5

$$a=\frac{\sum_{i=1}^{n}t_i^4\sum_{i=1}^{n}\xi_i-\sum_{i=1}^{n}t_i^2\sum_{i=1}^{n}t_i^2\cdot\xi_i}{n\sum_{i=1}^{n}t_i^{\,4}-\left(\sum_{i=1}^{n}t_i^2\right)^2}=\frac{34\cdot15356-10\cdot32372}{5\cdot34-10^2}=2834{,}057143$$

$$b=\frac{\sum_{i=1}^{n}\xi_i t_i}{\sum_{i=1}^{n}t_i^{\,2}}=\frac{278}{10}=27{,}8$$

$$c=\frac{n\cdot\sum_{i=1}^{n}t_i^2\cdot\xi_i-\sum_{i=1}^{n}t_i^2\cdot\sum_{i=1}^{n}\xi_i}{n\sum_{i=1}^{n}t_i^{\,4}-\left(\sum_{i=1}^{n}t_i^2\right)^2}=\frac{5\cdot32372-10\cdot15356}{5\cdot34-10^2}=118{,}5714286$$

$$v_{II}=\left[\frac{\sum_{i=1}^{m}\left|\xi_i-\xi_{t_i}^{II}\right|}{n}:\frac{\sum_{i=1}^{m}\xi_i}{n}\right]\cdot100=\frac{\sum_{i=1}^{m}\left|\xi_i-\xi_{t_i}^{II}\right|}{\sum_{i=1}^{m}\xi_i}\cdot100=\frac{1396{,}5}{15356}\cdot100=9{,}09\%$$

- if the data's history concerning the ξ variable, where ξ **= the global manufacture of olive oil,** „inspires" an exponential equation $\xi_{t_i}=ab^{t_i}$, than *a* and *b* will be [2]:

$$\lg a=\frac{\begin{vmatrix}\sum_{i=1}^{n}\lg\xi_i & \sum_{i=1}^{n}t_i\\ \sum_{i=1}^{n}t_i\lg\xi_i & \sum_{i=1}^{n}t_i^{\,2}\end{vmatrix}}{\begin{vmatrix}n & \sum_{i=1}^{n}t_i\\ \sum_{i=1}^{n}t_i & \sum_{i=1}^{n}t_i^{\,2}\end{vmatrix}}=\frac{\sum_{i=1}^{n}\lg\xi_i\sum_{i=1}^{n}t_i^{\,2}-\sum_{i=1}^{n}t_i\lg\xi_i\sum_{i=1}^{n}t_i}{n\sum_{i=1}^{n}t_i^{\,2}-\left(\sum_{i=1}^{n}t_i\right)^2}\qquad \lg b=\frac{\begin{vmatrix}n & \sum_{i=1}^{n}\lg\xi_i\\ \sum_{i=1}^{n}t_i & \sum_{i=1}^{n}t_i\lg\xi_i\end{vmatrix}}{\begin{vmatrix}n & \sum_{i=1}^{n}t_i\\ \sum_{i=1}^{n}t_i & \sum_{i=1}^{n}t_i^{\,2}\end{vmatrix}}=\frac{n\cdot\sum_{i=1}^{n}t_i\lg\xi_i-\sum_{i=1}^{n}\lg\xi_i\sum_{i=1}^{n}t_i}{n\sum_{i=1}^{n}t_i^{\,2}-\left(\sum_{i=1}^{n}t_i\right)^2}$$

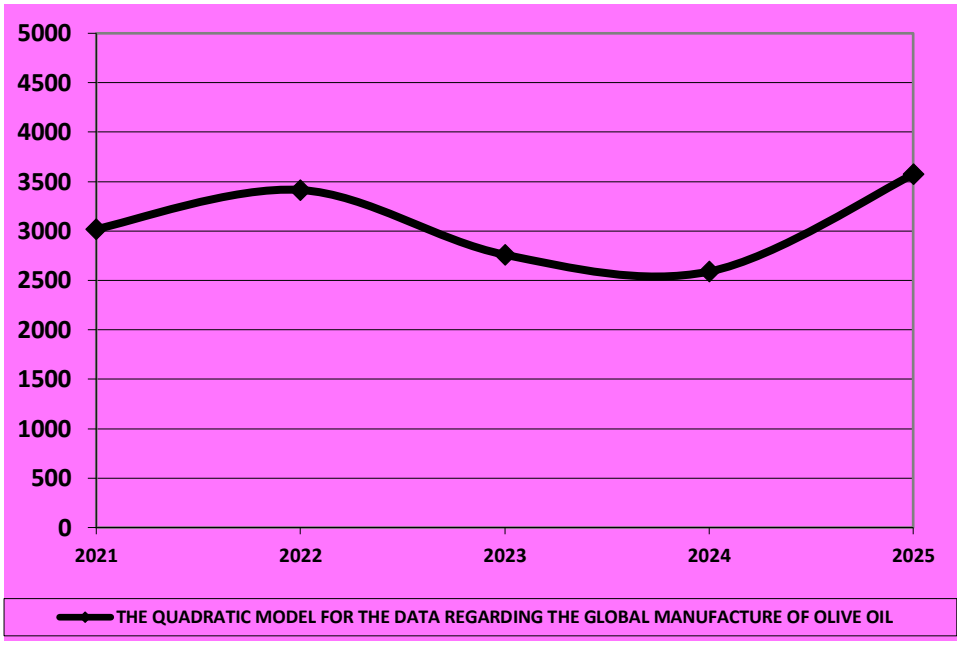
Table 4 The „data's screenplay" for the global manufacture of olive oil, if this shows an exponential model

YEARS	THE GLOBAL MANUFACTURE OF OLIVE OIL (thousands tons) (ξ_i)	EXPONENTIAL TREND					
		t_i	$\lg\xi_i$	$t_i\lg\xi_i$	$\lg\xi_{t_i}=\lg a+t_i\lg b$	$\xi_{t_i}=ab^{t_i}$	$\left\|\xi_i-\xi_{t_i}\right\|$
2021	**3020**	-2	3,480006943	-6,960013886	3,478959976	3012,728362	7,3
2022	**3415**	-1	3,533390708	-3,533390708	3,481515011	3030,505043	384,5
2023	**2760**	0	3,440909082	0	3,484070047	3048,386622	288,4
2024	**2589**	+1	3,413132050	+3,413132050	3,486625083	3066,373712	477,4
2025	**3572**	+2	3,552911450	+7,105822900	3,489180118	3084,466928	487,5
TOTAL	**15356**	0	17,42035023	0,025550356			1645,1

$$\lg a=\frac{17{,}42035023\cdot10}{5\cdot10}=3{,}484070047\qquad \lg b=\frac{5\cdot0{,}025550356}{5\cdot10}=0{,}0025550356$$

$$v_{\exp}=\left[\frac{\sum_{i=1}^{n}\left|\xi_i-\xi_{t_i}^{\exp}\right|}{n}:\frac{\sum_{i=1}^{n}\xi_i}{n}\right]\cdot100=\frac{\sum_{i=1}^{n}\left|\xi_i-\xi_{t_i}^{\exp}\right|}{\sum_{i=1}^{n}\xi_i}\cdot100=\frac{1645{,}1}{15356}\cdot100=10{,}71\%$$

$$v_{II}=9{,}09\%<v_I=10{,}69\%<v_{\exp}=10{,}71\%$$



Graph 1 The quadratic model's architecture for the global manufacture of olive oil, between 2021-2025

The values regarding **the global manufacture of olive oil which was realized** suggest a quadratic „trek" $\xi_{t_i} = a + b \cdot t_i + ct_i^2$

$$\xi_{2026}^{GLOBAL\_OLIVE\_OIL} = 2834{,}057143 + 27{,}8 \cdot 3 + 118{,}5714286 \cdot 3^2 = 3984{,}6\ \_\ thousands\ \_\ tons$$
$$\xi_{2027}^{GLOBAL\_OLIVE\_OIL} = 2834{,}057143 + 27{,}8 \cdot 4 + 118{,}5714286 \cdot 4^2 = 4842{,}4\ \_\ thousands\ \_\ tons$$
$$\xi_{2028}^{GLOBAL\_OLIVE\_OIL} = 2834{,}057143 + 27{,}8 \cdot 5 + 118{,}5714286 \cdot 5^2 = 5937{,}3\ \_\ thousands\ \_\ tons$$
$$\xi_{2029}^{GLOBAL\_OLIVE\_OIL} = 2834{,}057143 + 27{,}8 \cdot 6 + 118{,}5714286 \cdot 6^2 = 7269{,}4\ \_\ thousands\ \_\ tons$$
$$\xi_{2030}^{GLOBAL\_OLIVE\_OIL} = 2834{,}057143 + 27{,}8 \cdot 7 + 118{,}5714286 \cdot 7^2 = 8838{,}7\ \_\ thousands\ \_\ tons$$

3. The „screening's scenography" of the data's tendency which indicates the manufacture of olive oil in E.U. between 2021-2025

Table 5 The „data's screenplay" for the manufacture of olive oil in E.U. between 2021-2025

YEARS	THE MANUFACTURE OF OLIVE OIL IN E.U. (thousands tons) (λ_i)
2021	**2051**
2022	**2272**
2023	**1392**
2024	**1549**
2025	**2110**

Source: www.Agri-Food Data Portal

- if the data's history regarding the λ variable, where λ = **the manufacture of olive oil in E.U.,** „inspires" a linear equation $\lambda_{t_i} = a + b \cdot t_i$, than *a* and *b* will be [2]:

Table 6 The „data's screenplay" for the manufacture of olive oil in E.U., if this shows a linear model

YEARS	THE MANUFACTURE OF OLIVE OIL IN E.U. (thousands tons) (λ_i)	LINEAR TREND				
		t_i	t_i^2	$t_i\lambda_i$	$\lambda_{t_i} = a + bt_i$	$\lvert\lambda_i - \lambda_{t_i}\rvert$
2021	**2051**	-2	4	-4102	1995,8	55,2
2022	**2272**	-1	1	-2272	1935,3	336,7
2023	**1392**	0	0	0	1874,8	482,8
2024	**1549**	+1	1	+1549	1814,3	265,3
2025	**2110**	+2	4	+4220	1753,8	356,2
TOTAL	**9374**	0	10	-605	**9374**	1496,2

$$a = \frac{\sum_{i=1}^{n}\lambda_i \sum_{i=1}^{n} t_i^{\,2} - \sum_{i=1}^{n}\lambda_i t_i \sum_{i=1}^{n} t_i}{n\sum_{i=1}^{n} t_i^{\,2} - \left(\sum_{i=1}^{n} t_i\right)^2} = \frac{9374 \cdot 10}{5 \cdot 10} = 1874{,}8$$

$$b = \frac{n\sum_{i=1}^{n}\lambda_i t_i - \sum_{i=1}^{n} t_i \sum_{i=1}^{n}\lambda_i}{n\sum_{i=1}^{n} t_i^{\,2} - \left(\sum_{i=1}^{n} t_i\right)^2} = \frac{5 \cdot (-605)}{5 \cdot 10} = -60{,}5$$

$$v_I = \left[\frac{\sum_{i=1}^{n}\left|\lambda_i - \lambda_{t_i}^{I}\right|}{n} : \frac{\sum_{i=1}^{n}\omega_i}{n}\right] \cdot 100 = \frac{\sum_{i=1}^{n}\left|\lambda_i - \lambda_{t_i}^{I}\right|}{\sum_{i=1}^{n}\lambda_i} \cdot 100 = \frac{1496{,}2}{9374} \cdot 100 = 15{,}96\%$$

- if the data's history regarding the λ variable, where λ = **the manufacture of olive oil in E.U.**, „inspires" a quadratic equation $\lambda_{t_i} = a + b \cdot t_i + ct_i^2$, than *a* and *b* will be [4]:

Table 7 The „data's screenplay" for the manufacture of olive oil in E.U., if this shows a quadratic model

YEARS	THE MANUFACTURE OF OLIVE OIL IN E.U. (thousands tons) (λ_i)	PARABOLIC TREND					
		t_i	t_i^2	t_i^4	$t_i^2\lambda_i$	$\lambda_{t_i} = a + bt_i + ct_i^2$	$\lvert\lambda_i - \lambda_{t_i}\rvert$
2021	**2051**	-2	4	16	8204	2241,085715	190,1
2022	**2272**	-1	1	1	2272	1812,657143	459,3
2023	**1392**	0	0	0	0	1629,514286	237,5
2024	**1549**	+1	1	1	1549	1691,657143	142,7
2025	**2110**	+2	4	16	8440	1999,085714	110,9
TOTAL	**9374**	0	10	34	20465	9374	1140,5

$$a = \frac{\sum_{i=1}^{n} t_i^{\,4} \sum_{i=1}^{n}\lambda_i - \sum_{i=1}^{n} t_i^{\,2} \sum_{i=1}^{n} t_i^{\,2} \cdot \lambda_i}{n\sum_{i=1}^{n} t_i^{\,4} - \left(\sum_{i=1}^{n} t_i^{\,2}\right)^2} = \frac{34 \cdot 9374 - 10 \cdot 20465}{5 \cdot 34 - 10^2} = 1629{,}514286$$

$$b = \frac{\sum_{i=1}^{n}\lambda_i t_i}{\sum_{i=1}^{n} t_i^{\,2}} = -\frac{605}{10} = -60{,}5$$

$$c = \frac{n \cdot \sum_{i=1}^{n} t_i^{\,2} \cdot \lambda_i - \sum_{i=1}^{n} t_i^{\,2} \cdot \sum_{i=1}^{n}\lambda_i}{n\sum_{i=1}^{n} t_i^{\,4} - \left(\sum_{i=1}^{n} t_i^{\,2}\right)^2} = \frac{5 \cdot 20465 - 10 \cdot 9374}{5 \cdot 34 - 10^2} = 122{,}6428571$$

$$v_{II} = \left[\frac{\sum_{i=1}^{n} \left| \lambda_i - \lambda_{t_i}^{II} \right|}{n} : \frac{\sum_{i=1}^{n} \lambda_i}{n} \right] \cdot 100 = \frac{\sum_{i=1}^{n} \left| \lambda_i - \lambda_{t_i}^{II} \right|}{\sum_{i=1}^{n} \lambda_i} \cdot 100 = \frac{1140,5}{9374} \cdot 100 = 12,17\%$$

- if the data's history regarding the λ variable, where λ = **the manufacture of olive oil in E.U.**, „inspires" an exponential equation $\lambda_{t_i} = ab^{t_i}$, than *a* and *b* will be [2]:

Table 8 The „data's screenplay" for the manufacture of olive oil in E.U., if this shows an exponential model

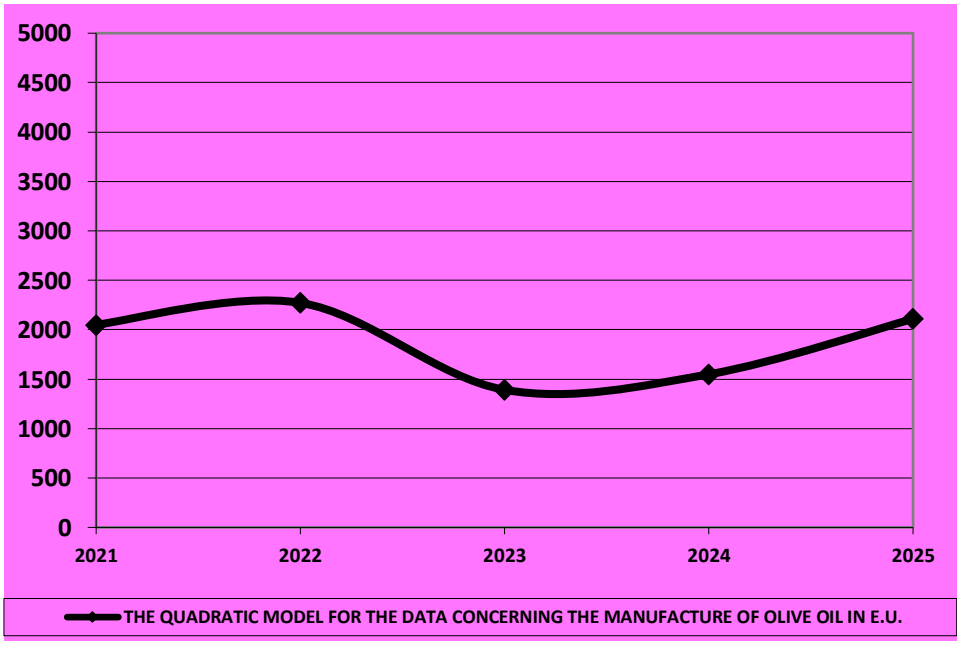
YEARS	THE MANUFACTURE OF OLIVE OIL IN E.U. (thousands tons) (λ_i)	EXPONENTIAL TREND					
		t_i	$\lg \lambda_i$	$t_i \lg \lambda_i$	$\lg \lambda_{t_i} = \lg a + t_i \lg b$	$\lambda_{t_i} = ab^{t_i}$	$\left\lvert \lambda_i - \lambda_{t_i} \right\rvert$
2021	**2051**	-2	3,31196566	-6,623931321	3,293614083	1966,138389	84,9
2022	**2272**	-1	3,356408327	-3,356408327	3,279441751	1903,012982	369,0
2023	**1392**	0	3,143639235	0	3,265269419	1841,914297	449,9
2024	**1549**	+1	3,190051418	+3,190051418	3,251097087	1782,777265	233,8
2025	**2110**	+2	3,324282455	+6,648564911	3,236924755	1725,538903	384,5
TOTAL	**9374**	0	16,3263471	-0,141723319			1522,1

$$\lg a = \frac{\sum_{i=1}^{n} \lg \lambda_i \sum_{i=1}^{n} t_i^2 - \sum_{i=1}^{n} t_i \lg \lambda_i \sum_{i=1}^{n} t_i}{n \sum_{i=1}^{n} t_i^2 - \left(\sum_{i=1}^{n} t_i \right)^2} = \frac{16,3263471 \cdot 10}{5 \cdot 10} = 3,265269419$$

$$\lg b = \frac{n \cdot \sum_{i=1}^{n} t_i \lg \lambda_i - \sum_{i=1}^{n} \lg \lambda_i \sum_{i=1}^{n} t_i}{n \sum_{i=1}^{n} t_i^2 - \left(\sum_{i=1}^{n} t_i \right)^2} = \frac{5 \cdot (-0,141723319)}{5 \cdot 10} = -0,0141723319$$

$$v_{\exp} = \left[\frac{\sum_{i=1}^{n} \left| \lambda_i - \lambda_{t_i}^{\exp} \right|}{n} : \frac{\sum_{i=1}^{n} \lambda_i}{n} \right] \cdot 100 = \frac{\sum_{i=1}^{n} \left| \lambda_i - \lambda_{t_i}^{\exp} \right|}{\sum_{i=1}^{n} \lambda_i} \cdot 100 = \frac{1522,1}{9374} \cdot 100 = 16,24\%$$

$$v_{II} = 12,17\% < v_I = 15,96\% < v_{\exp} = 16,24\%$$



Graph 2 The quadratic model's architecture for the manufacture of olive oil in E.U., between 2021-2025

The values concerning **the manufacture of olive oil in E.U.** suggest a quadratic „trek" $\lambda_{t_i} = a + b \cdot t_i + ct_i^2$

$$\xi_{2026}^{E.U._OLIVE\_OIL} = 1629{,}514286 + (-60{,}5) \cdot 3 + 122{,}6428571 \cdot 3^2 = 2551{,}8\_thousands\_tons$$
$$\xi_{2027}^{E.U._OLIVE\_OIL} = 1629{,}514286 + (-60{,}5) \cdot 4 + 122{,}6428571 \cdot 4^2 = 3349{,}8\_thousands\_tons$$
$$\xi_{2028}^{E.U._OLIVE\_OIL} = 1629{,}514286 + (-60{,}5) \cdot 5 + 122{,}6428571 \cdot 5^2 = 4393{,}1\_thousands\_tons$$
$$\xi_{2029}^{E.U._OLIVE\_OIL} = 1629{,}514286 + (-60{,}5) \cdot 6 + 122{,}6428571 \cdot 6^2 = 5681{,}7\_thousands\_tons$$
$$\xi_{2030}^{E.U._OLIVE\_OIL} = 1629{,}514286 + (-60{,}5) \cdot 7 + 122{,}6428571 \cdot 7^2 = 7215{,}5\_thousands\_tons$$

4. The „screening's scenography of the data's tendency which indicates the manufacture of olive oil in Spain between 2021-2025

Table 9 The „data's screenplay" for the manufacture of olive oil in Spain between 2021-2025

YEARS	THE MANUFACTURE OF OLIVE OIL IN SPAIN (thousands tons) (λ_i)
2021	**1389**
2022	**1491**
2023	**666**
2024	**855**
2025	**1419**

Source: www.Agri-Food Data Portal

- if the data's history concerning the ω variable, where ω = **the manufacture of olive oil in Spain,** „inspires" a linear equation $\omega_{t_i} = a + b \cdot t_i$, than *a* and *b* will be [2]:

Table 10 The „data's screenplay" for the manufacture of olive oil in Spain, if this shows a linear model

YEARS	THE MANUFACTURE OF OLIVE OIL IN SPAIN (thousands tons) (ω_i)	LINEAR TREND				
		t_i	t_i^2	$t_i\omega_i$	$\omega_{t_i} = a + bt_i$	$\lvert\omega_i - \omega_{t_i}\rvert$
2021	**1389**	-2	4	-2778	1279,2	109,8
2022	**1491**	-1	1	-1491	1221,6	269,4
2023	**666**	0	0	0	1164,0	498,0
2024	**855**	+1	1	+855	1106,4	251,4
2025	**1419**	+2	4	+2838	1048,8	370,2
TOTAL	**5820**	0	10	-576	**5820**	1498,8

$$a = \frac{\sum_{i=1}^{n}\omega_i \sum_{i=1}^{n} t_i^{\,2} - \sum_{i=1}^{n}\omega_i t_i \sum_{i=1}^{n} t_i}{n\sum_{i=1}^{n} t_i^{\,2} - \left(\sum_{i=1}^{n} t_i\right)^2} = \frac{5820 \cdot 10}{5 \cdot 10} = 1164$$

$$b = \frac{n\sum_{i=1}^{n}\omega_i t_i - \sum_{i=1}^{n} t_i \sum_{i=1}^{n}\omega_i}{n\sum_{i=1}^{n} t_i^{\,2} - \left(\sum_{i=1}^{n} t_i\right)^2} = \frac{5 \cdot (-576)}{5 \cdot 10} = -57{,}6$$

$$v_I = \left[\frac{\sum_{i=1}^{n}\left|\omega_i - \omega_{t_i}^I\right|}{n} : \frac{\sum_{i=1}^{n}\omega_i}{n}\right] \cdot 100 = \frac{\sum_{i=1}^{n}\left|\omega_i - \omega_{t_i}^I\right|}{\sum_{i=1}^{n}\omega_i} \cdot 100 = \frac{1498{,}8}{5820} \cdot 100 = 25{,}75\%$$

- if the data's history concerning the ω variable, where ω = **the manufacture of olive oil in Spain,** „inspires" a quadratic $\omega_{t_i} = a + b \cdot t_i + ct_i^2$, than *a* and *b* will be [2]:

Table 11 The „data's screenplay" for the manufacture of olive oil in Spain, if this shows a quadratic model

YEARS	THE MANUFACTURE OF OLIVE OIL IN SPAIN (thousands tons) (ω_i)	PARABOLIC TREND					
		t_i	t_i^2	t_i^4	$t_i^2\omega_i$	$\omega_{t_i} = a + bt_i + ct_i^2$	$\lvert\omega_i - \omega_{t_i}\rvert$
2021	**1389**	-2	4	16	5556	1556,057143	167,1
2022	**1491**	-1	1	1	1491	1083,171429	407,8
2023	**666**	0	0	0	0	887,1428571	221,1
2024	**855**	+1	1	1	855	967,9714285	113,0
2025	**1419**	+2	4	16	5676	1325,657143	93,3
TOTAL	**5820**	0	10	34	13578	**5820**	1002,3

$$a = \frac{\sum_{i=1}^{n} t_i^4 \sum_{i=1}^{n} \omega_i - \sum_{i=1}^{n} t_i^2 \sum_{i=1}^{n} t_i^2 \cdot \omega_i}{n\sum_{i=1}^{n} t_i{}^4 - \left(\sum_{i=1}^{n} t_i^2\right)^2} = \frac{34 \cdot 5820 - 10 \cdot 13578}{5 \cdot 34 - 10^2} = \frac{62100}{70} = 887{,}1428571$$

$$b = \frac{\sum_{i=1}^{n} \omega_i t_i}{\sum_{i=1}^{n} t_i{}^2} = -\frac{576}{10} = -57{,}6$$

$$c = \frac{n \cdot \sum_{i=1}^{n} t_i^2 \cdot \omega_i - \sum_{i=1}^{n} t_i^2 \cdot \sum_{i=1}^{n} \omega_i}{n\sum_{i=1}^{n} t_i{}^4 - \left(\sum_{i=1}^{n} t_i^2\right)^2} = \frac{5 \cdot 13578 - 10 \cdot 5820}{5 \cdot 34 - 10^2} = 138{,}4285714$$

$$v_{II} = \left[\frac{\sum_{i=1}^{n} \left|\omega_i - \omega_{t_i}^{II}\right|}{n} : \frac{\sum_{i=1}^{n} \omega_i}{n} \right] \cdot 100 = \frac{\sum_{i=1}^{n} \left|\omega_i - \omega_{t_i}^{II}\right|}{\sum_{i=1}^{n} \omega_i} \cdot 100 = \frac{1002{,}3}{5820} \cdot 100 = 17{,}22\%$$

- if the data's history concerning the ω variable, where ω = **the manufacture of olive oil in Spain,** „inspires" an exponential equation $\omega_{t_i} = ab^{t_i}$, than *a* and *b* will be [2]:

Table 12 The „data's screenplay" for the manufacture of olive oil in Spain, if this shows an exponential model

YEARS	THE MANUFACTURE OF OLIVE OIL IN SPAIN (thousands tons)	EXPONENTIAL TREND					
		t_i	$\lg \omega_i$	$t_i \lg \omega_i$	$\lg \omega_{t_i} = \lg a + t_i \lg b$	$\omega_{t_i} = ab^{t_i}$	$\lvert\omega_i - \omega_{t_i}\rvert$
2021	**1389**	-2	3,142702246	-6,285404491	3,089310772	1228,317875	160,7
2022	**1491**	-1	3,173477643	-3,173477643	3,067015649	1166,851662	324,2
2023	**666**	0	2,823474229	0	3,044720526	1108,461277	442,5
2024	**855**	+1	2,931966115	+2,931966115	3,022425403	1052,992803	198,0
2025	**1419**	+2	3,151982395	+6,303964791	3,000130280	1000,300026	418,7
TOTAL	**5820**	0	15,22360263	-0,222951228			1544,1

$$\lg a = \frac{\sum_{i=1}^{n} \lg \omega_i \sum_{i=1}^{n} t_i^2 - \sum_{i=1}^{n} t_i \lg \omega_i \sum_{i=1}^{n} t_i}{n\sum_{i=1}^{n} t_i^2 - \left(\sum_{i=1}^{n} t_i\right)^2} = \frac{15,22360263 \cdot 10}{5 \cdot 10} = 3,044720526$$

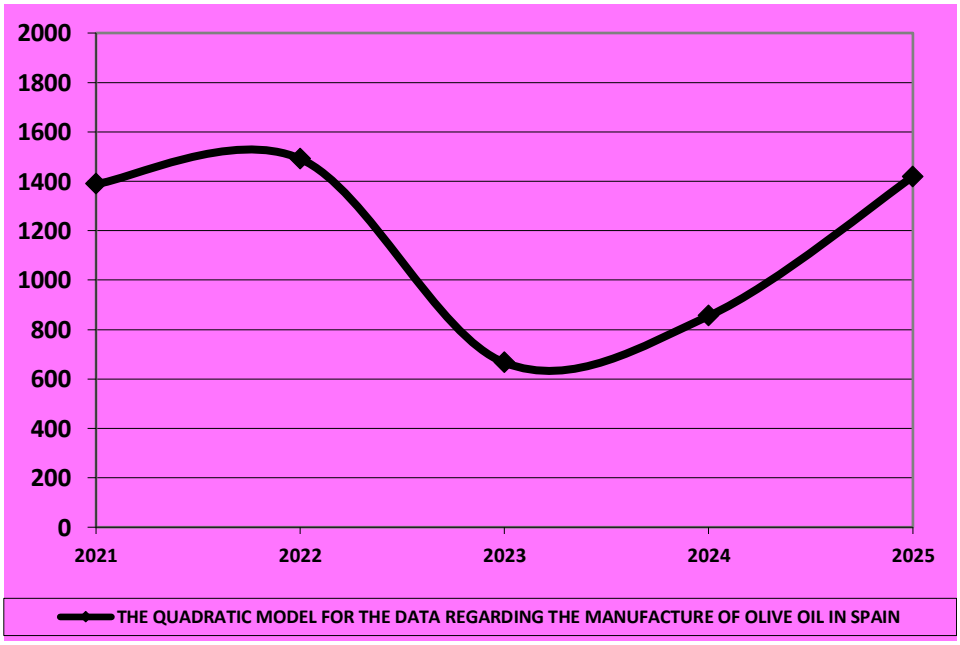
$$\lg b = \frac{n \cdot \sum_{i=1}^{n} t_i \lg \omega_i - \sum_{i=1}^{n} \lg \omega_i \sum_{i=1}^{n} t_i}{n\sum_{i=1}^{n} t_i^2 - \left(\sum_{i=1}^{n} t_i\right)^2} = \frac{5 \cdot (-0,222951228)}{5 \cdot 10} = -0,0222951228$$

$$v_{\exp} = \left[\frac{\sum_{i=1}^{n} \left| \omega_i - \omega_{t_i}^{\exp} \right|}{n} : \frac{\sum_{i=1}^{n} \omega_i}{n} \right] \cdot 100 = \frac{\sum_{i=1}^{n} \left| \omega_i - \omega_{t_i}^{\exp} \right|}{\sum_{i=1}^{n} \omega_i} \cdot 100 = \frac{1544,1}{5820} \cdot 100 = 26,53\%$$

$$v_{II} = 17,22\% < v_I = 25,75\% < v_{\exp} = 26,53\%$$

The values concerning **the manufacture of olive oil in Spain** suggest a quadratic „trek" $\varpi_{t_i} = a + b \cdot t_i + ct_i^2$

$$\xi_{2026}^{OLIVE\_OIL\_SPAIN} = 887,1428571 + (-57,6) \cdot 3 + 138,4285714 \cdot 3^2 = 1960,2\_thousands\_tons$$
$$\xi_{2027}^{OLIVE\_OIL\_SPAIN} = 887,1428571 + (-57,6) \cdot 4 + 138,4285714 \cdot 4^2 = 2871,6\_thousands\_tons$$
$$\xi_{2028}^{OLIVE\_OIL\_SPAIN} = 887,1428571 + (-57,6) \cdot 5 + 138,4285714 \cdot 5^2 = 4059,8\_thousands\_tons$$
$$\xi_{2029}^{OLIVE\_OIL\_SPAIN} = 887,1428571 + (-57,6) \cdot 6 + 138,4285714 \cdot 6^2 = 5524,9\_thousands\_tons$$
$$\xi_{2030}^{OLIVE\_OIL\_SPAIN} = 887,1428571 + (-57,6) \cdot 7 + 138,4285714 \cdot 7^2 = 7266,9\_thousands\_tons$$



Graph 3 The quadratic model's architecture for the manufacture of olive oil in Spain, between 2021-2025

5. Conclusions

We can assess that, in the period 2026-2030, the global manufacture of olive oil will rise from 3984,4 thousands tons in 2026, to 8838,7 thousands tons in 2030. In the same period, the manufacture of olive oil in E.U. will increase from 2251,8 thousands tons in 2026, to 7215,5 thousands tons in 2030. Also, we can say with precision that, between 2026-2030, the manufacture of olive oil in Spain will raise from 1960,2 thousands tons in 2026, to 7266,9 thousands tons in 2030.

Practically, the ramifications created by this statistical exploration on the olive oil's „realm" consist in the reflection of the rise regarding the manufacture of olive oil between 2026-2030, at the global level, in E.U.

and in Spain, the leader in this domain. So, the worldwide population will benefit by an infusion of health achieved through this miraculous natural remedy named extra virgin olive oil and this fact will contribute at the increase of the life expectancy for the population at global level.

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