# NEW CONSIDERATIONS ABOUT INFLUENCE THE STAGE OF ECONOMIC DEVELOPMENT OF NATIONS AND THE PERCENTAGE OF ANIMAL HUSBANDRY

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*Abstract*
*The paper presents debates and analyses the causal relation between the level of economic development and the degree of development of the animal husbandry sector. There is a large variability in time and space at the level of the world's countries regarding this aspect. As a general trend it was observed in time an increase of the degree of development of the animal husbandry sector, with high differences among the countries being directly link to the level of development of each country. The sources of information used are the data base of FAOSTAT, WORLD BANK and EUROSTAT. There were collected data regarding the GDP per capita and the share of the value of animal husbandry production in the value of agricultural production. The data were analyzed for 14 countries from different geographical area.*
*The main method of research and analysis was the index method. The influence of the economic development on the development of the share of animal husbandry sector is revealed using the regression and correlation method.*

**Key words:** economic development, animal husbandry development, index, regression, correlation

## INTRODUCTION

Degree of development of the animal husbandry sector is the result of overall economic development of the country. The degree of development of the animal husbandry sector is the result of the general development of the country. From this point of view there is a large difference from one country to another and from period of time to other. The level of economic development is also correlated with the social structure of the country. Nowhere in the world during the time was not observed a healthy economy or a significant level of development of the animal husbandry sector if the social structure is a primitive one (a lot of peasants). As a general trend it can be underlined the increase of the degree of animal husbandry sector development being correlated with the level of economic development, but with high difference from one country to another and one region to another. The development of animal husbandry sector can be considerate the first step for the vertical development for both micro and macroeconomic level. The degree of development of the animal husbandry is barometer for standard of leaving among the different countries of the world (Merce E. et

al, 2010). The logical consequence is the increase of economic efficiency and life quality.

After the Second World War, per capita annual consumption of bread fell visibly, while the share of animal protein in the daily ration increased substantially.

The role of the animals in the nation life is representative from the beginnings. Each nation valorized more or less the natural condition where was established. From this point of view is very relevant the statement of Hippolyte Taine about the Nordic nations: "the rain made the grass, the grass made the cow, the cow made milk-cheese-butter, and all these together with the beer made the efficient Nordic man." Hence the world's economic distribution based on the animal husbandry development sector is the result of the natural conditions, on one hand, and the way the man knew how to take advantage of them, on the other hand (Merce E. et al, 2013).

## MATERIAL AND METHOD

To achieve the scientific objective, a sample was stratified, with 40 of the 184 countries with complete data. The sample was constituted by random sampling of 10 countries of the 4-layer size quartile of GDP per capita. In this regard, information sources are generous site FAOSTAT and World Bank provides rigorous information on the main indicators of economic development and on the state of the livestock sector and share of animal husbandry. It was taken data on gross domestic product per capita and the percentage value of livestock production in the agricultural production value. The selection of countries was taken into account and their geographical location in various parts of the world.

The main method of analysis is represented by the indices method. Status of the main indicators of economic development and the share of animal husbandry is analyzed compared to the level of the 40 countries. The main indicators which reflect the current economic situation and the degree of development of the animal husbandry sector were analyzed with the help of regression and correlation.

## RESULTS AND DISSCUSIONS

Statistical analysis of the 40 countries included in the sample proves unquestionably that the assumption of a causal relationship between economic development and the overall share of animal husbandry is tested. It is obviously a causal relationship type stochastic and determined action of other factors, such as climatic conditions and agricultural production profile. Some exceptions, like the case of France, can be explained the economic and natural particularities which have deep roots in the history (Table 1).

Table 1

Agricultural production, animal production and GDP value in the sample of 40 countries

| No. | Country | GDP/capita thousands $ | Agriculture prod. value thousands $ | Husbandry prod. value thousands $ | Husbandry percentage % |
|---|---|---|---|---|---|
| 1. | Bermuda | 85140 | 2185 | 1123 | 51,40 |
| 2. | Denmark | 58930 | 7114911 | 5152451 | 72,42 |
| 3. | Singapore | 55182 | 28532 | 23629 | 82,82 |
| 4. | Netherlands | 47617 | 13736023 | 9819638 | 71,49 |
| 5. | Germany | 45085 | 36971131 | 23359187 | 63,18 |
| 6. | France | 41421 | 42083296 | 20348350 | 48,35 |
| 7. | Brunei Darussalam | 38563 | 40068 | 33931 | 84,68 |
| 8. | Puerto Rico | 29463 | 353593 | 258713 | 73,17 |
| 9. | Oman | 22181 | 376785 | 131371 | 34,87 |
| 10. | Equatorial Guinea | 20572 | 48698 | 1463 | 33,00 |
| 11. | Uruguay | 16351 | 4372709 | 2564763 | 58,65 |
| 12. | Barbados | 15719 | 47314 | 31332 | 66,22 |
| 13. | Lithuania | 14215 | 2202007 | 1054095 | 47,87 |
| 14. | Poland | 13432 | 21245225 | 10322956 | 48,59 |
| 15. | Gabon | 11571 | 308425 | 77595 | 25,16 |
| 16. | Brazil | 11208 | 145643101 | 60702083 | 41,68 |
| 17. | Romania | 9499 | 8516975 | 3665539 | 43,04 |
| 18. | Colombia | 7826 | 14096016 | 6988224 | 49,58 |
| 19. | Botswana | 7317 | 323650 | 281057 | 36,84 |
| 20. | Peru | 6660 | 9659025 | 3391030 | 35,11 |
| 21. | Thailand | 5779 | 3962520 | 1030744 | 26,01 |
| 22. | Ecuador | 5720 | 7320178 | 3420942 | 46,73 |
| 23. | Namibia | 5462 | 412273 | 285115 | 39,16 |
| 24. | Paraguay | 4403 | 5489868 | 1542966 | 28,11 |
| 25. | Tunisia | 4329 | 6211685 | 1356278 | 21,83 |
| 26. | Guatemala | 3478 | 4535129 | 904843 | 19,95 |
| 27. | Sri Lanka | 3280 | 2964746 | 390981 | 13,19 |
| 28. | Morocco | 3109 | 8975512 | 3106067 | 34,61 |
| 29. | Bolivia | 2868 | 3690224 | 1510554 | 40,93 |
| 30. | Honduras | 2291 | 2270011 | 713301 | 31,42 |
| 31. | Nicaragua | 1851 | 1640532 | 789618 | 48,13 |
| 32. | Ghana | 1850 | 7219840 | 503299 | 6,97 |
| 33. | Zambia | 1540 | 1758313 | 463260 | 26,35 |
| 34. | Cameroon | 1315 | 5593094 | 811031 | 14,50 |
| 35. | Kenya | 994 | 8831961 | 3209138 | 16,34 |
| 36. | Tanzania | 695 | 34147421 | 6221670 | 18,22 |
| 37. | Rwanda | 633 | 2498395 | 238961 | 9,56 |
| 38. | Uganda | 572 | 8844195 | 1825538 | 20,64 |
| 39. | Liberia | 454 | 413803 | 62283 | 15,05 |
| 40. | Burundi | 267 | 993263 | 88451 | 8,91 |

Source: FAOSTAT | © FAO Statistics Division 2014 | 28 July 2014;
Catalog Sources World Development Indicators, 28 July 2014

For numerical evaluation of causality studied are presented in relation of correspondence, gross domestic product per capita (thousand $ / capita) and the share of animal husbandry the countries analyzed (%), (Table 2).

<div align="right">Table 2</div>

Correlation overall economic development and level of animal husbandry

| No. | Country | GDP thousands $/capita - 2013 - | The share of animal husbandry % |
|---|---|---|---|
| 1. | Bermuda | 85,140 | 51,40 |
| 2. | Denmark | 58,930 | 72,42 |
| 3. | Singapore | 55,182 | 82,82 |
| 4. | Netherlands | 47,617 | 71,49 |
| 5. | Germany | 45,085 | 63,18 |
| 6. | France | 41,421 | 48,35 |
| 7. | Brunei Darussalam | 38,563 | 84,68 |
| 8. | Puerto Rico | 29,463 | 73,17 |
| 9. | Oman | 22,181 | 34,87 |
| 10. | Equatorial Guinea | 20,572 | 33,00 |
| 11. | Uruguay | 16,351 | 58,65 |
| 12. | Barbados | 15,719 | 66,22 |
| 13. | Lithuania | 14,215 | 47,87 |
| 14. | Poland | 13,432 | 48,59 |
| 15. | Gabon | 11,571 | 25,16 |
| 16. | Brazil | 11,208 | 41,68 |
| 17. | Romania | 9,499 | 43,04 |
| 18. | Colombia | 7,826 | 49,58 |
| 19. | Botswana | 7,317 | 36,84 |
| 20. | Peru | 6,660 | 35,11 |
| 21. | Thailand | 5,779 | 26,01 |
| 22. | Ecuador | 5,720 | 46,73 |
| 23. | Namibia | 5,462 | 39,16 |
| 24. | Paraguay | 4,403 | 28,11 |
| 25. | Tunisia | 4,329 | 21,83 |
| 26. | Guatemala | 3,478 | 19,95 |
| 27. | Sri Lanka | 3,280 | 13,19 |
| 28. | Morocco | 3,109 | 34,61 |
| 29. | Bolivia | 2,868 | 40,93 |
| 30. | Honduras | 2,291 | 31,42 |
| 31. | Nicaragua | 1,851 | 48,13 |
| 32. | Ghana | 1,850 | 6,97 |
| 33. | Zambia | 1,540 | 26,35 |
| 34. | Cameroon | 1,315 | 14,50 |
| 35. | Kenya | 0,994 | 16,34 |
| 36. | Tanzania | 0,695 | 18,22 |
| 37. | Rwanda | 0,633 | 9,56 |
| 38. | Uganda | 0,572 | 20,64 |
| 39. | Liberia | 0,454 | 15,05 |
| 40. | Burundi | 0,267 | 8,91 |

Using the option regression from the data analysis package in Excel was obtaining the following parameters of the regression line and the correlation coefficient (Table 3).

<div align="right">Table 3</div>

Regression and correlation line

| Regression line | Coefficients |
|---|---|
| **a** | **27,44** |
| **b** | **0,7505** |
| **Correlation coefficient** | **0,7115** |
| Determination coefficient | 0,5062 |
| Standard error | 14,9140 |
| The sample volume | 40 |

Regression line:

$$\bar{y}(x) = 27,44 + 0,7505x$$

At every 1000$ GDP per capita the share of animal husbandry development increases approximately by 0,7505 percent.

The causality relation between the economic development level and the degree of development animal husbandry level can be represented also by graphic (figure 1).

The adjusted value of the regression line based on the variance of GDP per capita can be observed in Table 4.

<div align="right">Table 4</div>

| X | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 |
|---|---|---|---|---|---|---|---|---|
| Y | 34,95 | 42,45 | 49,96 | 57,46 | 64,97 | 72,47 | 79,98 | 87,48 |

Graphically, the causal relationship between economic development of a country and its share of animal husbandry is presented as Figure 1.
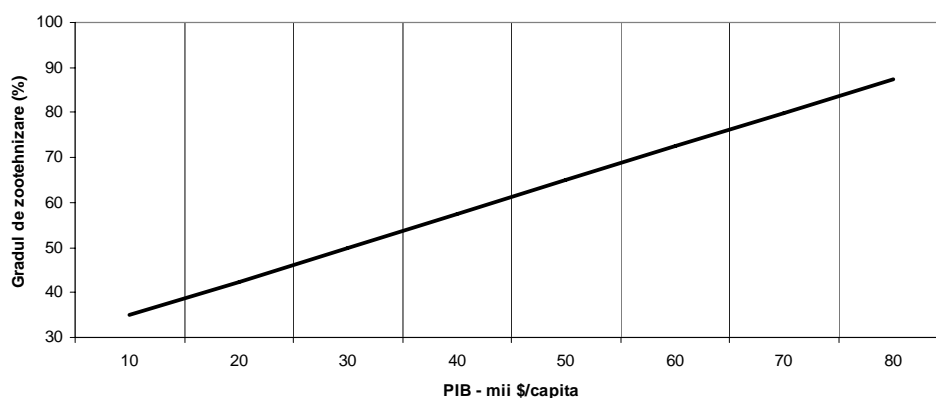


Fig. 1 – Evolution of the animal husbandry
depending on the size of gross domestic product per capita

The F test was use to find the significance of the correlation coefficient. It proves to be very significant (Table 5).

Table 5

ANOVA

| Variance | Degree of freedom | Sum of squares | Mean square | F | Significant F |
|---|---|---|---|---|---|
| Between groups | 1,00 | 8666,49 | 8666,49 | 38,96 | 0,00000027 |
| Within groups | 38,00 | 8452,22 | 222,43 | | |
| Total | 39,00 | 17118,72 | | | |

The value of the correlation coefficient (0.7115) indicates an intense correlation, and the F test confirms that the correlation coefficient is very significant.

A special problem for Romania is the evolution of animal husbandry share over various historical periods. The statistics confirm that over a period of over 150 years, the share of animal husbandry with small oscillations beat still (Table 6).

Table 6

| The development of livestock (1862-1918) | | | | | |
|---|---|---|---|---|---|
| Period | Value of agricultural production (gold lei / inhabitant) | | | | |
| | Total | Plant | Animal husbandry | Share of animal husbandry **(%)** | Hierarchy **1921=100** |
| 1862-1866 | 202 | 111 | 92 | **45,5** | 94,0 |
| 1867-1871 | 230 | 135 | 95 | **41,3** | 85,3 |
| 1872-1876 | 224 | 132 | 92 | **41,1** | 84,9 |
| 1877-1880 | 243 | 152 | 91 | **37,4** | 77,3 |
| 1881-1885 | 234 | 145 | 89 | **38,0** | 78,5 |
| 1886-1890 | 256 | 169 | 86 | **33,6** | 69,4 |
| 1891-1895 | 256 | 173 | 83 | **32,4** | 66,9 |
| 1896-1900 | 233 | 155 | 78 | **33,5** | 69,2 |
| 1901-1905 | 253 | 172 | 81 | **32,0** | 66,1 |
| 1906-1910 | 242 | 168 | 74 | **30,6** | 63,2 |
| 1911-1915 | 242 | 170 | 72 | **29,8** | 61,6 |
| 1916-1918 | 242 | 169 | 73 | **30,0** | 62,0 |
| *Source: Axenciuc: II, 823 (quote by Bogdan Murgescu, p. 138)* | | | | | |
| The development of livestock (*1919-1939*) | | | | | |
| Period | Value of agricultural production (gold lei / inhabitant) | | | | |
| | Total | Plant | Animal husbandry | Share of animal husbandry **(%)** | Hierarchy **1921=100** |
| 1919 | 210 | 129 | 81 | **38,6** | 79,8 |
| 1920 | 210 | 121 | 89 | **42,5** | 87,8 |
| 1921 | 213 | 110 | 103 | **48,4** | 100,0 |
| 1922 | 246 | 131 | 115 | **46,6** | 96,3 |
| 1923 | 250 | 138 | 113 | **45,0** | 93,0 |
| 1924 | 227 | 119 | 108 | **47,5** | 98,1 |

| 1925 | 241 | 138 | 103 | **42,9** | 88,6 |
|---|---|---|---|---|---|
| 1926 | 271 | 166 | 105 | **38,7** | 80,0 |
| 1927 | 240 | 136 | 104 | **43,4** | 89,7 |
| 1928 | 237 | 133 | 104 | **43,7** | 90,3 |
| 1929 | 281 | 176 | 105 | **37,5** | 77,5 |
| 1930 | 262 | 161 | 101 | **38,4** | 79,3 |
| 1931 | 254 | 168 | 86 | **33,7** | 69,6 |
| 1932 | 235 | 137 | 98 | **41,6** | 86,0 |
| 1933 | 245 | 146 | 99 | **40,6** | 83,9 |
| 1934 | 229 | 124 | 105 | **45,9** | 94,8 |
| 1935 | 234 | 139 | 95 | **40,7** | 84,1 |
| 1936 | 243 | 155 | 88 | **36,3** | 75,0 |
| 1937 | 229 | 144 | 85 | **37,0** | 76,4 |
| 1938 | 241 | 152 | 89 | **36,9** | 76,2 |
| 1939 | 241 | 154 | 87 | **35,9** | 74,2 |

*Source: Axenciuc: II, 700, 822  (quote by Bogdan Murgescu, p. 242-243)*

**The development of livestock (*1961-2011*)**

| Period | Mil. US constant prices (2004-2006) | | | | |
|---|---|---|---|---|---|
| | Total | Plant | Animal husbandry | Share of animal husbandry **(%)** | Hierarchy **1921=100** |
| 1961 | 8942 | 6160 | 2782 | **31,11** | 64,3 |
| 1965 | 8564 | 5640 | 2924 | **34,14** | 70,5 |
| 1970 | 9161 | 5355 | 3806 | **41,55** | 85,8 |
| 1975 | 12321 | 7022 | 5299 | **43,01** | 88,9 |
| 1980 | 14665 | 8595 | 6070 | **41,39** | 85,5 |
| 1985 | 17190 | 11076 | 6114 | **35,57** | 73,5 |
| 1990 | 13136 | 7123 | 6013 | **45,77** | 94,6 |
| 1995 | 13286 | 7801 | 5485 | **41,28** | 85,3 |
| 2000 | 11182 | 6463 | 4719 | **42,20** | 87,2 |
| 2005 | 13108 | 7870 | 5238 | **39,96** | 82,6 |
| 2011 | 13799 | 8902 | 4897 | **35,49** | 73,3 |

*Source:* FAOSTAT | © FAO Statistics Division 2013 | 06 October 2013

Comparative analysis of the percentage owned livestock in Romania, over 150 years, does not record significant changes. Average percentage of animal husbandry between 1862 and 1918 was 35.42% with 14.52% scattering coefficient. During the interwar period, the average percentage of animal husbandry was 41.04%, scattered them with a coefficient of only 10.22%. Regarding the communist period, the average percentage of animal husbandry was 39.22%, but with a degree of scattered them all relatively small, 11.40%. Maximum percentage owned livestock was Achieved in 1921 (48.4%) and the minimum in the range 1911 to 1915 (29.8%).

**CONCLUSIONS**

The results presented, it proves that one can not speak of modern agriculture in the overall economy backward, and the first step in the modernization of agriculture is increasing its animal husbandry. In turn, the economic development of a country is the result of development and harmonious combination of the various branches of the national economy (industry, transport, infrastructure, services, etc.). All this leads to a certain social structure of the country.

Economies primitive social structures (many peasants) are clearly underperforming in terms of economic and subsistence agriculture is practiced. There is nowhere in the world advanced countries with a high share of the peasants. It is typical in this respect, the situation of England, which had in 1901 only 9% share of the population employed in agriculture. Romania, even after World War II, in 1947, had 80% of peasants (Merce E., 2011). Advance of the major economic powers of the world, or economic stratification of the world is not only the developments of the last decades. These differences have deep historical roots that can locate while since the Renaissance. To highlight this fact, mention that the Land Register in England (Doomsday Book) was developed in 1086). In Romania, even today, do not have a Land Registry done.

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