INFORMATICS MODEL REGARDING THE ANALYSIS OF SOME TECHNICAL AND ECONOMIC INDICATORS IN ANIMAL HUSBANDRY

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Abstract

In Romania, animal husbandry is a basic sub branch of agriculture, which in the last two decades had an oscillate evolution, determined by the negative influence of some factors that were after the year 1990.

Negative phenomena have led to radical changes in the evolution of herds and animals productions; the most species have seen a reduction in number and lower obtained yields.

To revive and improve the technical-economic performance of livestock farms, the authors have proposed to develop a computer model aimed at creating a database, which is the reference point for analysis the key indicators.

Designing the information model regarding the technical and economic analysis in livestock farming was based on analysis of the following data: land cultivated with fodder, livestock, on species and categories, fixed assets of the units (buildings and agrozootechnical construction, machinery and agricultural equipment, installations, means of transport, etc.), total production and production for sale, costs of production, selling prices, subsidies, credits, total revenues, financial costs etc.

Based on this information it will determine the main synthetic and analytical indicators on unit performance, indicators which must fall within certain limits of efficiency.

The advantage of computer designed model can result in data storage and renewing of data with overall economic growth.

Key words: informatics model, indicators, animal husbandry, efficiency.

INTRODUCTION

In Romania, animal husbandry is a basic sub branch of agriculture, which in the last two decades had an oscillating trend, driven by the influence of negative factors that were beyond the year 1990.

Negative phenomena have led to radical changes in the evolution of herds and livestock production, which in most species have seen a reduction in number and lower yields obtained.

Both worldwide and in Romania **the demand for agricultural products and food** is constantly increasing, being determined by several factors:

- increasing number of population;

- increased income of population;

- changing in the structure of agricultural products and food;

- ensure of national reserve of food and agricultural products, etc.

A feature of agriculture is **the use in the production of living organisms** (plants and animals), which are regarded as true *"living machines"*.

As a means of production, the animals display certain features, such as:

- animals may be used successively as a means of workt, labor and objects of consumer goods;

- to ensure the renewal of the herd and, for continuity of production is necessary to maintain a certain number of animals corresponding with natural breeding conditions, specific for each species of animals;

- animal attrition doesn't begins as soon as they are used as means of production, but much later, corresponding with the curves of organic production;

- animals may not be subject to partial replacement, as do other means of production (machines, buildings, buildings), therefore the duration of use is determined by the specific of biological species. After the duration of operation (use) is over, the waste animals are reformed and replaced by new ones [1,3,5].

To revive and improve the technical-economic performance of livestock farms, the authors have proposed the developing of a computer model aimed at creating a

database, which constitutes the reference point for the analysis of key indicators.

MATERIAL AND METHOD

The design of the model was based on analyzing the following data: land cultivated with fodder, livestock by species and categories, fixed assets of units (their depreciation), the total production and production for sale, costs of production, selling prices, subsidies, credits, total income, financial expenses, etc.

Using this information it will determine the main synthetic and analytical indicators regarding the unit performance, indicators which must fall within certain limits of efficiency.

RESULTS AND DISCUSSIONS

The computer model was made in the Excel program. The interface comprises link to 6 Excel pages.

To return to the first page click the BACK button on each page. It shall only enter data in white cells.

Based on these data, are calculated indicators on sectors (plant and animal husbandry) and on the total unit.

Figure 1 – Interface of informatics model

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EXPLANATIONS
VEGETAL SECTOR
VEGETAL SECTOR INDICATORS
ANIMAL HUSBANDRY SECTOR
ANIMAL HUSBANDRY INDICATORS
TOTAL UNIT INDICATORS

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Indicators must fall within certain limits of efficiency, as follows:

1. Gross profit rate must be > 10%
2. Risk of exploitation
   - <10% - the company is in a risky or unstable situation;
   - 10% - 20% - the company is in a relatively stable situation;
   - > 20% - the company is in a situation with no significant risks or comfortable.
3. The net result of the financial year > 0

For example, it was realized a model of a milk cow's farm with a herd of 100 heads. To ensure the necessary fodder we take into account 0.6 hectares per head. The structure of cultures was done according to the feed ration, so that the total feed produced to be used in animal feed (tab. 1, tab. 2).

Indicators of the vegetal sector are calculated for each crop, and also on total. In this way, you can see the effectiveness of each culture and at need it can be replace the unprofitable crops with ones more profitable, but which can provide the total necessary nutrients (tab. 3, tab. 4).

In the livestock sector, the indicators are calculated for each category of animal and on total (tab. 5, tab. 6, tab.7).

For the calculation of indicators on the total unit it was considered the self consumption from vegetal (which in the given example was 100%) and the livestock (milk needed to calves feed) sector (table 8, tab.9).

Table 1
Data from vegetal sector

Year	Culture	Surface hectare	The average main production (kg/he)	The average secondary production (straws) (kg/he)	Fixed costs (lei/he)	Seed/planting material (lei/he)	Fertilizers (lei/he)
2009	ALFALFA	9,00	13000,00	-	70,00	288,00	-
	SILAGE CORN	10,00	40000,00	-	70,00	220,00	105,00
	CORN	10,00	7000,00	10500,00	70,00	220,00	105,00
	SOY	5,00	3000,00	-	70,00	150,00	-
	WHEAT	14,00	3500,00	3500,00	70,00	210,00	95,00
	BEET FOR FEED	2,00	80000,00	-	70,00	350,00	105,00
	SUNFLOWER	10,00	3000,00	12000,00	70,00	420,00	90,00

Table 2
Data from vegetal sector

Year	Culture	Pesticides (lei/he)	Diesel (lei/he)	Lease (lei/he)	Insurance (lei/he)	Services performed by third parties (lei/he)	Personnel costs (lei/he)	Other operating expenses (lei/he)	Selling price for main production (lei/kg)	Selling price for secondary production (lei/kg)	Subsidies (lei/he)
2009	ALFALFA	-	350,00	250,00	100,00	300,00	80,00	100,00	0,20	-	400,00
	SILAGE CORN	70,00	300,00	250,00	100,00	300,00	150,00	100,00	0,06	-	400,00
	CORN	70,00	300,00	250,00	100,00	300,00	300,00	100,00	0,40	0,02	400,00
	SOY	90,00	300,00	250,00	150,00	300,00	200,00	100,00	0,80	-	400,00
	WHEAT	150,00	300,00	250,00	100,00	300,00	90,00	100,00	0,50	0,04	400,00
	BEET FOR FEED	170,00	400,00	250,00	200,00	300,00	500,00	100,00	0,05	0,01	400,00
	SUNFLOWER	80,00	300,00	250,00	100,00	300,00	250,00	100,00	1,10	-	400,00

Table 3
Indicators from vegetal sector

Year	Culture	Surface hectare	The total main production (tones)	The total secondary production (tones)	Total variable costs (lei/he)	Total costs (lei/he)	Production costs (lei/kg)	Operating turnover (lei/he)	Gross margin (lei/he)	Standard gross margin (lei/he)
2009	ALFALFA	9,00	117,00	-	1468,00	1538,00	0,12	2600,00	1132,00	1532,00
	SILAGE CORN	10,00	400,00	-	1595,00	1665,00	0,04	2400,00	805,00	1205,00
	CORN	10,00	70,00	105,00	1745,00	1815,00	0,23	3010,00	1265,00	1665,00
	SOY	5,00	15,00	0,00	1540,00	1610,00	0,54	2400,00	860,00	1260,00
	WHEAT	14,00	49,00	49,00	1595,00	1665,00	0,44	1890,00	295,00	695,00
	BEET FOR FEED	2,00	160,00	-	2375,00	2445,00	0,03	4000,00	1625,00	2025,00
	SUNFLOWER	10,00	30,00	120,00	1890,00	1960,00	0,65	3300,00	1410,00	1810,00

Table 4
Indicators from vegetal sector

Year	Culture	Surface hectare	Gross profit (lei/he)	Gross profit rate per he (%)	Threshold of profitability (kg/he)	Risk of exploitation (%)	Turnover on year (lei)	Total costs on year (lei)	Gross profit on year (lei)	Gross profit rate on year (%)
2009	ALFALFA	1062,00	69,05	804	1517,14	1062,00	156.960,00	104.492,00	52.468,00	50,21
	SILAGE CORN	735,00	44,14	3478	1050,00	735,00				
	CORN	1195,00	65,84	464	1520,18	1195,00				
	SOY	790,00	49,07	244	1128,57	790,00				
	WHEAT	225,00	13,51	1581	139,14	225,00				
	BEET FOR FEED	1555,00	63,60	3446	2221,43	1555,00				
	SUNFLOWER	1340,00	68,37	149	1914,29	1340,00				

Table 5
Data from animal husbandry sector

Year	Category of animals	Number of animals	The main production (kg;l;pieces/year)	The secondary production (manure) (tones/year)	Fixed costs (lei/year)	Feed/Premix (lei/year)	Drugs (lei/year)	Animal insurance (lei/year)	Personnel costs (lei/year)	Other costs (lei/year)	Selling price for main production (lei/kg;l;pices)	Selling price for secondary production (lei/tone)	Subsidies (lei)
2009	MILK COWS	100,00	6500,00	8,00	100,00	1658,60	60,00	300,00	360,00	50,00	1,00	-	2650,00
	CALVES	80,00	50,00	2,00	-	-	-	-	-	-	7,00	-	-

Table 6
Indicators from animal husbandry sector

Year	Category of animals	Number of animals	The total main production (1000 UM)	The total secondary production (tone)	Variable costs - total (lei/year)	Total costs (lei/year)	Production cost (lei/kg;l)	Operating turnover (lei/year)	Gross margin (lei/year)	Standard gross margin (lei/he)	Gross profit (lei/he)	Profit per feed animal (lei)
2009	MILK COWS	100,00	650,00	800,00	242860,00	252860,00	0,39	650000,00	407140,00	672140,00	397140,00	3971,40
	CALVES	80,00	4,00	160,00	-	-	-	28000,00	28000,00	28000,00	28000,00	350,00

Table 7
Indicators from animal husbandry sector

Year	Category of animals	Number of animals	Gross profit rate (%)	Threshold of profitability (kg; l; pieces/year)	Risk of exploitation (%)	Turnover on year - total (lei)	Total costs per year - total (lei)	Gross profit per year - total	Gross profit rate per year - total (%)
2009	MILK COWS	100,00	157,06	159,65	3971,40	678000,00	252860,00	425140,00	168,13
	CALVES	80,00	-	-	-				

Table 8
Indicators per unit

Year	Self consumption - main vegetal prod.- kg	Self consumption secondary vegetal prod. - kg	Self consumption - main animal prod. kg;l;pieces	Self consumption - secondary animal prod. - tone	Main prod. for sale - vegetal sector - kg	Sec. prod. for sale - vegetal sector - kg	Main prod. for sale - animal sector - kg;l;pieces	Sec. prod. for sale – animal sector- tone	Turnover - lei	Subsidies - lei	Other income - lei	Total income - lei
2009	117000,00	-	36500	800,00	_	_	613500,00	-	613500,00	268600,00	-	882100,00
	400000,00	-	-	160,00	_	_	4000,00	-	28000,00	4000,00	-	32000,00
	70000,00	105000,00	_	_	_	_	_	_	_	4000,00	_	4000,00
	15000,00	-	_	_	_	_	_	_	_	2000,00	_	2000,00
	49000,00	49000,00	_	_	_	_	_	_	_	5600,00	_	5600,00
	160000,00	-	_	_	_	_	_	_	_	800,00	_	800,00
	30000,00	120000,00	-	-	-	-	-	-	-	4000,00	-	4000,00

Table 9
Indicators per unit

Year	Material costs – total lei	Personnel costs – total - lei	Depreciation costs - lei	Other operating costs - lei	Operating costs - total - lei	Financiar income – total - lei	Interest costs - lei	Other financiar costs - lei	Financial costs - total - lei	Financial result - lei	Gross results of the financial year -TOTAL- lei	Tax on profit / Turnover - lei	Net results of the financial year -TOTAL- lei
2009	188232,00	36720,00	150500	11750,00	387202,00	2300	200000	1500	201500	-199200	253448,00	40551,68	212896,32
	7650,00	1500,00	_	7500,00	16650,00	_	_	_	_	_			
	7650,00	3000,00	_	7500,00	18150,00	_	_	_	_	_			
	3050,00	1000,00	_	4000,00	8050,00	_	_	_	_	_			
	11550,00	1260,00	_	10500,00	23310,00	_	_	_	_	_			
	2190,00	1000,00	_	1700,00	4890,00	_	_	_	_	_			
	9600,00	2500,00	_	7500,00	19600,00	_	_	_	_	_			

CONCLUSIONS

1. To increase the performance of agricultural units, a particular role has the use of software that allows the determination and analysis of key technical-economic indicators developments.

2. The informatics projected program can have multiple utilities, of which mention the most important:

- storing and updating data on the vegetal sector and / or livestock in the long term;
- the main technical-economic indicators on branches and sectors of activity;
- forecasting of technical-economic indicators trends of the vegetal sector and / or livestock, and at enterprise level;
- technical - economic substantiation of decisions regarding the production capacity, reduce costs, maximize profits, etc.

3. In the future it is recommended the extension of such software in the farm and differentiates according to the units profile and specialization.

REFERENCES

Journal articles

[5] Gîndu Elena, Chiran A., Ciobotaru Elena-Adina, Dima T., 2001 – Aspecte privind marketingul laptelui şi a produselor lactate la Societatea Agricolă AGROIND Berezeni, jud. Vaslui. Lucrări ştiinţifice, Seria Agronomie, vol. 44, Iaşi.

[8] Şerbănescu Luminița, Necşulescu Consuela, 2008 – Projecting the informatic subsystem for raw material and finished producrs inventory management.Lucr. şt. seria I, vol. X (2) – Management agricol. Ed. AGROPRINT Timişoara.

Books

[1] Anghel L., Florescu C., Zaharia R., 1999 – Aplicaţii în marketing. Ed. Expert, Bucureşti.

[2] Chiran A., şi colab., 2007 - Marketing în agricultură. Ed. Alma Print Galaţi, Galaţi.

[3] Chiran A., Gîndu Elena, 2007 - Zooeconomie. Ed. PIM, Iaşi.

[4] Gaceu L., 2006 – Inginerie asistată de calculator. Ed. INFOMARKET, Braşov.

[6] Merce Elena şi colab., 1999 – Strategii de dimensionare a factorilor de producţie în agricultură. Ed. ALETHEIA, Bistriţa.

[7] Merce Elena, Merce C.C., Arion F.H., 1999 – Simularea unui proces tehnico+economic în cadrul exploataţiei agricole. Ed. STANDARD, Cluj-Napoca.