INFLUENCE OF METEOROGICAL FACTORS ON THE EMISSIONS GENERATED BY A FARM AGROZOOTECHNICAL

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Abstract: *Given the increasing share of striking the livestock sector in the national economy is of great interest to know which are emissions generated by this and their influences on environmental factors. This paper aims to examine correlations that exist between emissions in atmosphere by notching animal farms and meteorological factors. To realize this work I make some measurements at various livestock farms. Noted that all the farms are located in different zone of the Bihor County, where the weather conditions and topography are different. I note that measurements were made with a sampler for particulate matter and with a digital gas analyzer type Oldham MX21.I also has been used mathematical simulation of dispersion of pollutants generated by equations of mathematical physics. n the equations, leading to simulate pollutant dispersion is found meteorological factors such as wind speed, temperature, upward movement of air masses, humidity, etc. Initially it presents briefly, to highlight the technological process emissions at every stage of the technological process and also in order to extract their properties. Theme paper is not addressed in the first, but certainly is a topical issue through themes. Theme is studied by the scientific community of all countries with focus on environmental protection and the development of society in correlation with the principles of sustainable development. In this connection European scientific communities are remarkable efforts that try to achieve standards that must be respected in the breeding activities. Practical implications of research, importance of work: This paper proves its usefulness especially for guiding entrepreneurs in choosing the best locations for future Agrozootechnical firm and providing information indicative of policy makers in the field of environmental protection in such an objective economic analysis. The importance of the work result by highlighting how emissions from the activity of pigs in a growth industry affects livestock farming communities*

Key words: *meteorological factors, emissions, farms, agro zootehnycal*

INTRODUCTION

In order to achieve correlation between meteorological factors and atmospheric emissions generated by a livestock farm activity analysis was performed of livestock farms. The unit is located in the area X, Bihor county.

Target area is associated with close relationships:

′ north: agricultural land;

′ west: farmland and national road - the cca.4 km

′ south houses rare and communal road;

′ east: agricultural land over 350m.

Climate characteristics are influenced by general atmospheric circulation, air masses, for location and landscape features.

Bihar is the county's influence in the western movement, carrying wet oceanic air masses, is characterized by a moderate continental temperate climate.

The village is located in north-eastern Bihar district, 36 km from Oradea that village 20 km from Bihar.

Figure 1: The site of the farm

The general circulation of atmosphere

The entire area is exposed, mainly general air circulation from the west, over which overlaps with a local circulation, influenced by ascending currents, determine the northern slopes of the mountains.

Air temperature

It specifies a temperate-continental natural dam average .Indebted role that it plays all of the Apuseni Mountains, the western air masses towards the value of air temperature changes occur from west to east.

Air temperatures are moderate variations from one month to another, from one season to other. The lowest temperature recorded in January, absolute minimum temperature recorded in the last 50 years was -22.8 ° C. Maximum temperature absolute, a number of 50 years was 36.8 ° C in August.

The average annual temperature is 10.2 ° C, with positive monthly values throughout the year except January 1 (-2.1 ° C). The highest monthly average values were recorded in the year warm period from May to October with averaged 20.4 ° C in the month of July.

The annual number of days with frost, the multiannual average is 93.Cele several days with ground frost are in December - January and 22 days - 25 days.

Multiannual average duration of sunshine

Insolation duration is on average 2056.3 multiannual hours. Most are sunniest July with an average of 285.9 hours to 266.2 hours in August.

Precipitation

Relative humidity is slightly high as a moderately temperate, developed as a result of action prevailing air masses oceanic origin. The most lower air relative humidity values recorded in August and 65% higher in December 87%. Annual average is 74%. The relative air humidity of interest because it contributes to the formation of fog, with greater frequency in the cold season .The fog associating it with dust in the atmosphere, contributing to increased area by increasing doping condensation nuclei.

Multi-annual average rainfall is 595 l / mp. The largest quantities of rainfall were recorded in June 85l/mp and months with the lowest amounts of precipitation in February and March is 32 liters per year mp. The number of rainy days on average is 133.Cele multi wettest months are December (13.6 days), May (13.1 days) and the drought in October (7.8 days) and

September (8.4 days).

Fog occurs on average 37.6 days in the multi, the largest foggy days occur during the winter season, December (9.5 days)-January (9.0 days). The warm period of the year from May to August, the number monthly average is 0.5 to 0.8 days with fog days.

The wind

The wind in the area is influenced by the presence of the relief, alternating with high and low winds hinder advance east and northeast, but is open air masses of southern origin to participate at a frequency of 13.3% and average annual rate of 4 m / s and those involved with the SW frequency of 12.1% and an average annual rate of 3.8 m / s.

The area studied is characterized by low speeds of the wind. In 47.6% of cases, the wind speed is less than 2 m / s. Fervency moderate wind (speeds between 3-6 m / s) is about 38.74% and with wind speeds above 8 m / s is 9%.

Average wind speeds at ground level on the main directions of wind and their frequency are shown in Table 1:

Table 1

The wind direction	N	N NE	NE	E NE	E	E SE	SE	S SE	S
Average speed	3,5	3,9	3,2	2,5	2,6	2,5	2,4	3,0	4,3
%	7,2	4,5	3,7	1,1	7,3	10,2	6,1	3,2	11,3

The wind direction	S SV	SV	V SV	V	V NV	NV	N NV
Average speed	4,6	3,7	3,5	2,9	2,6	2,5	2,9
%	8,4	6,7	1,8	8,0	1,6	2,7	2,6

Table nomber 2 presents the appearance frequencies of the degrees of thermal stratification of the atmosphere:

Table.2

Stratification degree	Stable			Neutral	Unstable		
%	1,8	6,4	26,0	37,9	9,3	12,0	6,6

Air quality at the site, as in the whole area northeast of the county falls within the STAS norms in force.

Substances liable to infest the atmosphere, because of their farm work are:

- of NH3, H2S, water vapor and other harmful gases resulting from decomposition of manure (CH4, N2O), stored on the platform;

- Waste gases: CO, CO2, SO2, NOx, particulates from the boiler;

MATERIAL AND METHODS

Between17.07-18.08 2009 measurements were performed on concentrations of air pollutants using the apparatus Oldham MX 21 points considered representative for evaluating the quality of atmospheric air inside the unit. Results of determinations are shown in Tables 3 and 4 numbers. In table number 5 we present the evaluation of directed stationary emission sources.

RESULTS AND DISCUSSIONS

Tabel .3

NH_3, 17.07-25.08 2009

No.	Point determination	Data	Meteorological condition	Concentration (mg/mc)	CMA mg/mc /STAS 12574/87
1	Gate number 1	25.07	T=37°C Low turbulence	0.1	0,3
		01.08	T=34°C Low turbulence	0.06	0,3
		15.08	T=39°C Low turbulence	0.15	0,3
		22.08	T=33°C Low turbulence	0.08	0,3
2	Hall 1	25.07	T=37°C Low turbulence	0.06	0,3
		01.08	T=34°C Low turbulence	0.1	0,3
		15.08	T=39°C Low turbulence	0.15	0,3
		22.08	T=33°C Low turbulence	0.04	0,3
3	A farm battle	25.07	T=37°C Low turbulence	0.08	0,3
		01.08	T=34°C Low turbulence	0.02	0,3
		15.08	T=39°C Low turbulence	0.012	0,3
		22.08	T=33°C Low turbulence	0.02	0,3

- ✓ E_{SO2}=4,67 x 10^{-7} kg/kj x 15500 kj/kg x 30 kg/h = 0,2 kg/h = 28,6 mg/mc
- ✓ E_{NO2}=2,59 x 10^{-7} kg/kj x 15500 kj/kg x 30 kg/h = 0,116 kg/h = 166 mg/mc
- ✓ E_{CO}=2,87 x 10^{-8} kg/kj x 15500 kj/kg x 30 kg/h = 0,012 kg/h = 1,71 mg/mc
- ✓ E_P=2,98 x 10^{-7} kg/kj x 15500 kj/kg x 30 kg/h = 0,132 kg/h = 18,85mg/mc

CONCLUSIONS

Analyzing the data contained in tables show that the numbers 3, 4, 5 concentrations of NH3 and H2S is low so that people can not generate effects on the airflow.

Air environmental factor is not affected by potentially polluting substances, the only element of discomfort to him making up odors that wind is able to carry.

Tabel.4

H_2S 17.07-25.08

No.	Point determination	Data	Meteorological condition	Concentration (mg/mc)	CMA mg/mc /STAS 12574/87
1	Main door	25.07	T=37°C Low turbulence	0	0,015
		01.08	T=34°C Low turbulence	0	0,015
		15.08	T=39°C Low turbulence	0	0,015
		22.08	T=33°C Low turbulence	0	0,015
2	Hall 1	25.07	T=37°C Low turbulence	0	0,015
		01.08	T=34°C Low turbulence	0	0,015
		15.08	T=39°C Low turbulence	0	0,015
		22.08	T=33°C Low turbulence	0	0,015
3	Batal 1 farming	25.07	T=37°C Low turbulence	0	0,015
		01.08	T=34°C Low turbulence	0	0,015
		15.08	T=39°C Low turbulence	0	0,015
		22.08	T=33°C Low turbulence	0	0,015

Table 5.

	Pol lutant	Masic Flow (g/h)	Flow gas/air (Nmc/h)	Concentration in emission (mg/Nmc)	alert threshold (mg/Nmc)	Emission limitation threshold = contaminated /VLE BAT (mg/Nmc)
Boiler exhaust flue	CO,	12	7000	1,71	-	150mg/mc
	SO_2	200	7000	28,6	-	350mg/mc
	NO_x	166	7000	16,57	-	250mg/mc
	Pulberi	132	7000	18,85	-	20mc/mc
	CO_2	-	-	-	-	-

BIBLIOGRAFY

1. CIPLEA L., CIPLEA AL.,1978 - Poluarea mediului ambiant. Edit. Tehnică, Bucureşti
2. POP GH.,1988 - Întroducere în meteorologie şi climatologie. Edit. Ştiinţifică şi Enciclopedică. Bucureşti
3. BORSAN D. 1998 - Fizica atmosferei si poluarea aerului , Topografia Universitatii Bucuresti,
4. MINTAS O., 2009 – Meteorologie,climatologie,Ed.Universitatii Agora