UDC
631,862

PROCESS CONTROL IN manure Pets

D.A. Holub, PhD RL Shvets, a graduate student *

The above principle manure management at animal welfare by changing the dose bedding.

Dnoyivka, cattle, pig manure, humidity, litter.

Resolutionsca problems. Privacy silskohospodars- one production should be made on the basis of non-waste expanded reproduction of soil fertility. However, now spread methods of agricultural production based on the use of intensive technologies when plants need nutrition elements offset by mineral dobryv.Natomist dose of organic fertilizer on the order of less than the required amount to compensate for the loss of humus, leading to deterioration of biological properties and soil degradation.

Waste technologies is thus agricultural production, in which the negative environmental impact of missing or do not exceed limits sanitary standards and maximum allowable concentrations.

One element of cleaner production of agricultural products is the processing and use of manure.

In this regard, there is a need in managing manure of cattle (cattle) and pigs share weighing a total of manure largest in complete organic fertilizer technology using biogas digestion and composting.

Although a large number of studies, the issue of managing the manure, planning its subsequent distribution by varying doses of litter requires coning further research.

AnaLiz recent research. DIt livestock farms is a mixture of solid and liquid animal excrements, they dissolved mineral and gaseous substances, technological and flushing water

**** Supervisor - PhD, GA Dove***

waste feed. With high humidity, manure contains a significant amount of mineral and organic oxidizing agents difficult. At the same time have a good reserve of energy accumulated in its biomass.

DIt is used not only as an organic fertilizer him get yeast, biogas is used as an additive
in animal feed, based on growing worms, flies, duckweed, pitchers Salvini, chlorella, used in hydroponic systems [6, 8, 9, 10, 17].

Andle Yet, in most cases, manure used as
orgaNight fertilizer, as it not only increases the humus content of the soil, but also significantly improves its physical and chemical properties, increases the supply of nutrients, reduces acidity increases the absorption capacity, buffering, moisture content, porosity and permeability, enriching the soil microflora, enhances biological activity and release of carbon dioxide, reduces the resistance of workers in the processing of soil [1, 3, 4].

During processing of manure fermskyh enterprises is the source for gaseous fuels from biomethane and compost from manure and litter hnoyivky after methane fermentation, which should be the main type of organic fertilizers
roslynnytstvi.

Dnoyivka - fluid that is released from manure during its removal and storage. It is used to produce compost as organic fertilizer and liquid as biosyrovyny in biogas technology [3].

One of the most important principles of compost production is the addition of the starting mixture of carbon materials, which are the main componntom respiration and microbial nutrition and exercising
procwith aerobic digestion. When laying materials for composting need to maintain a certain ratio between nitrogen and carbon. To maintain the desired balance nitrogen rich materials saturated with carbon materials, including manure to add a relevant test bedding. To the composting process going in the right direction, compost mixture should have a carbon and nitrogen in the ratio *C: N* = 20-30: 1 (*C*- The amount of carbon *N*- The amount of nitrogen) [15].

Prand using manure for biogas production are two technologies: rare phase and solid phase. When solid phase technology there are difficulties associated with providing optimal conditions for the flow of microbial fermentation of biomass. In particular this applies to load and homogenization of biomass is
comes to digestion. Using liquid phase fermentation is a common practice in the use of biogas plants. At the same time, providing continuous injection of a small

Yieldsiyamy input in biomass digesters, which is a container mixer, which is supported by a given temperature and humidity without air [5].

Manure system with facilities for animals and the daily volume of manure significantly affect the manure storage volumes, and thus to dropsitalnyh costs required for their construction. In addition, the accumulation of raw materials necessary to take account of the fact that over time becomes manure nitrogen and organic matter, which largely determines the efficiency of the next stage of its use for production of compost and biogas [5].

It should be noted that methane fermentation does not provide disinfection of manure, which undergoes fermentation in biogas plants, except in the case of open storage of waste methane fermentation stand. For example, according to legisbers of the German renewable energy, increased emphasis closed storage space biomass after weaponsdzhuvannya. The size of such repositories are usually constructed volume that would ensure the maintenance of fermented biomass least 180 days [13].

We also proposed a technology that involves the collection sumixture of manure and litter along the zone accepted, its division into hnoyivku and bedding manure, removing them from livestock buildings and re hnoyivky for anaerobic digestion with biogas and litter manure containing bedding, composting and subsequent use of the resulting compost as organic fertilizers [5, 11].

Metand lit.idzhen. In thebecoming legisnomirnostey outputin hnoyivky of litter manure while keeping animals in a dose-dependent litter.

Rezultaty research. Dailyand the amount that can be hnoyivky getand from livestock enterprises depends on the daily amount of litter and the daily amount of manure that is caused by type, number of animals and the number and type of used litter.

It is well known that the daily amount of manure and bedding required amount and the total amount of the mixture on livestock enterprises are defined as follows:

$$Q_D = nq, \quad (1)$$

where Q_D – dshellsva animal manure, kg / day; n – forilkist animals goal q – daily output gbutth to tvarynnytskyh enterprises .;

according to VNHK-AIC 09.06 (Table. 1, Tab. 2) [14] listed

per sow (tab. 3), and a cash cow (tab. 4), kg / head. per day.

1. Daily values of output and humidity on pig excrement.

Groups of animals	In theyhid excrement and their composition					
	toof this		including			
			faeces		urine	
	mace, kg	toolohist, %	mace, kg	toolohist, %	mace, kg	toolohist, %
BookUrl	11.04	89.43	3.80	75.0	7.24	97.0
s						
			Sows:			
xolosti	8.80	90.87	2.46	73.8	6.34	97.5
pregnant	10,00	91.01	2.60	73.1	7.40	97.3
sucking	15.30	90.14	4.30	73.1	11,00	96.8
			Piglets age, days			
26-42	0.40	90.03	0.10	70.0	0.30	96.7
43-60	0.70	85.29	0.30	71.0	0.40	96.0
60-106	1.80	86.62	0.70	71.4	1.10	96.3
			Growing pigs weight, kg			
dat 70	5.00	86.98	2.05	73.0	2.95	96.7
wshe70	650	87,68	2,70	74.7	3,80	96.9
kg						

2. Daily values of output and excreta moisture on dairy farms.

Groups of animals	In theyhid excrement and their composition					
	toof this		including			
			faeces		urine	
	mace, kg	toolohist%	mace, kg	toolohist, %	mace, kg	toolohist%
Korovy	55,00	88.44	35,00	85.2	20,00	94.1
			Telyata repair:			
dabout 3	4.50	91.74	1.00	80.0	3.50	95.1
moDays 3 to 6	7.50	87.40	5.00	83.0	2.50	96.2
Esyatsiv						
			Telytsi and heifers:			
moDays 6 to 12	26,00	86.24	14,00	79.5	12,00	94.1

$$Q_P = nq, \qquad (2)$$

where daily requirement of litter kg / day; q_P- Daily need
Qp –
Sectionidstyltsi transferred per animal, kg / head. per day.

$$Q_C = n(q_D + q_P), \qquad (3)$$

where byshaping overall migra- daily amount of a mixture of manure
Q_C– and bedding kg / day.

3. The daily output of pig manure per sow.

Group of animals	In theyhid excrement and their			
	Kal		Urine	
	mace, kg	toolohist, %	mace, kg	toolohist, %
The main sow	2.9	72.2	7.8	97.2
Pemontni sows	1.0	73.8	2.5	97.5
BookUri and repair hryaky	0.1	75.0	0.3	97.0
Piglets	1.7	71.3	2.7	96.3
Growing pigs	12.2	74.0	17.3	96.8
FromGeneral notes yield and moisture	17.9	73.6	30.7	96.9
rozrahunkunaodnusvynomatku	48.5	kg	88.3	%

4. Exid flexibleaboutth Categoriesand pastoralx Sectionidpryyemstvah from Calculationsin one milch cow.

Group of animals	In theyhid excrement and their			
	faeces		urine	
	mace, kg	toolohist%	mace, kg	toolohist%
Milker	35	85.2	20	94.1
Heifers	4	80.0	3	94.4
In theyhid and flexibleof	39	84.7	23	94.1
per milch cow per day	62	kg	88.2	%

VoLOGISTICS litter manure at maximum water-holding capacity (MVZ) depends on type of litter and plant materials it is usually in the range of
76 to 84% [3]. It is known that the amount of water that exceeds the maximum water-holding capacity of litter manure due to the presence of litter, is:

$$Q^{In\ the}_{D} = Q_C \frac{W_C - Wp_H}{100 - WPN}, \quad (4)$$

where $Q^{In\ the}_{D}$ dshellsva amount of water that is not kept litter manure and goes to hnoyivky kg / day; W_C- Humidity mixture of manure and bedding,%; Wp_H- Litter manure moisture at a maximum amount of retained water (humidity at maximum water-holding capacity)%.

Obviously, humidity mixture of manure and bedding determined as foll ows :

$$W_C = \frac{qHW_D + qPW_P}{q_D + q_P}, \quad (5)$$

where W_C- Humidity mixture of manure and bedding,%; W_D- Moisture manure %;W_P- Litter moisture,%.

ConsideringThat daily amount is hnoyivky:

$$Qg_H = \frac{Q_D^{In\ the}}{W_{GN}}, \quad (6)$$

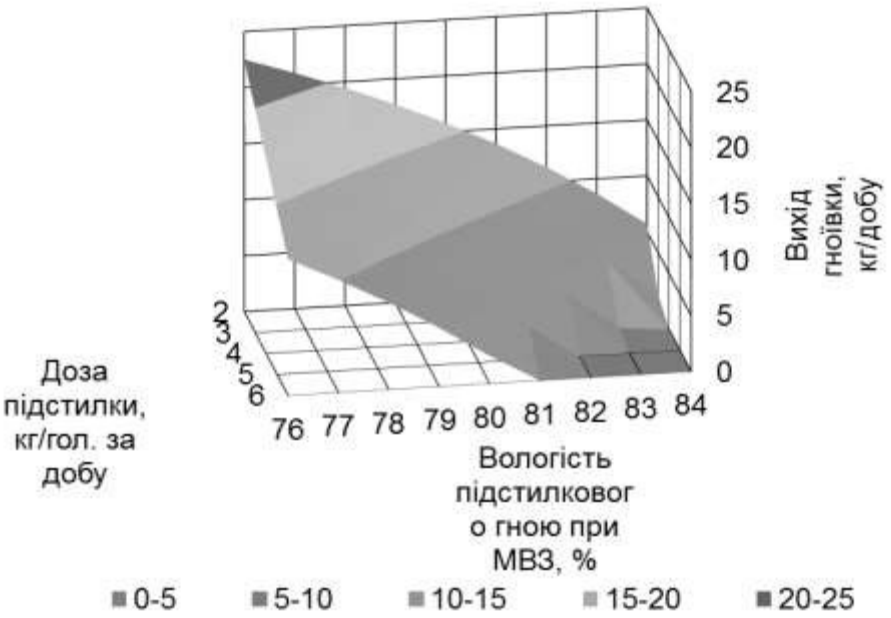
where dshellsva number hnoyivky kg / day; Wg_H- Hnoyivky humidity, Qg_H–
RH. units., and substituting the value of water in excess of the maximum water-holding capacity of litter manure due to the presence of litter, we obtain:

$$Q_{GN} = \frac{Q_C}{W_{GN}} \cdot \frac{W_C - W_{PN}}{100 - W_{PN}} = \frac{n(q_D + q_P)}{W_{GN}} \cdot \frac{W_C - W_{PN}}{100 - W_{PN}} =$$

$$= \frac{n(q_D + q_P)}{W_{GN}} \cdot \frac{\frac{qHW_D + qP}{W_P q_D + q_P} - WPN}{100 - WPN} =$$

$$= \frac{n}{W_{GN}} \cdot \frac{q_G W_G + q_P W_P - (q_D + q_P) W_{PH}}{100 - W_{PN}}. \quad (7)$$

Based on the equations dependence built out hnoyivky depending on the moisture content of litter manure at doses MVZ and litter for pigs (Fig. 1) and cows (Fig. 2).

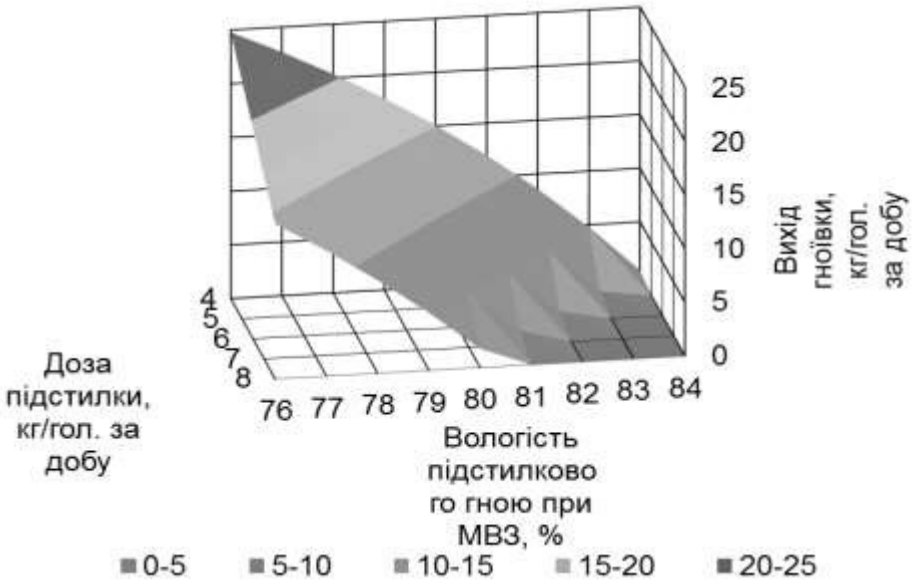


Ric. 1. Dependence of the moisture out hnoyivky litter manure at doses MVZ and litter for pigs.

Andstitutionalism mutual influence of humidity at MVZ litter manure and litter dose depending on the needs of the animal showed that maximum yield hnoyivky observed with decreasing litter and making

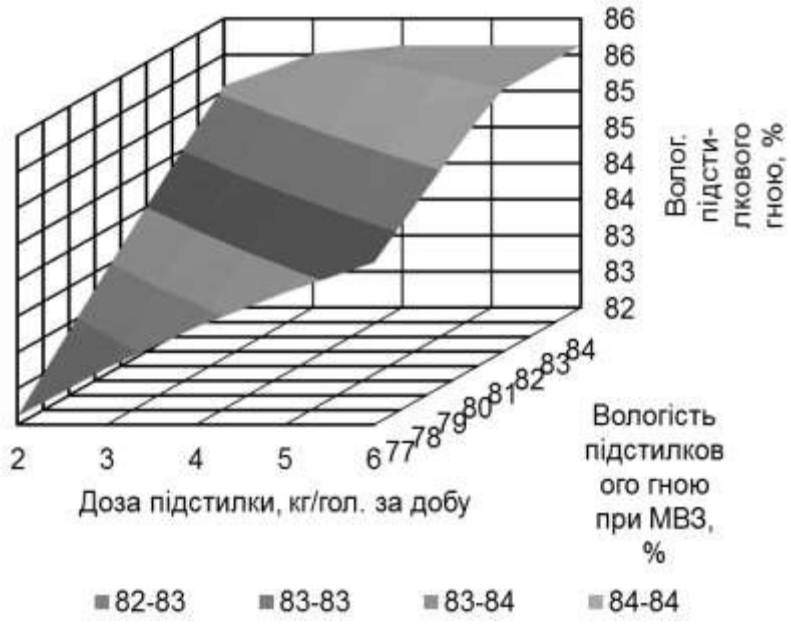
reducing humidity litter manure at HBM. Instead, with increasing litter entering from 4 to 6 kg / head. to

pigs and 5 to 8 kg / head per day for cattle will have no exit hnoyivky humidity changes within litter manure at MVZ 82 to 84% respectively.

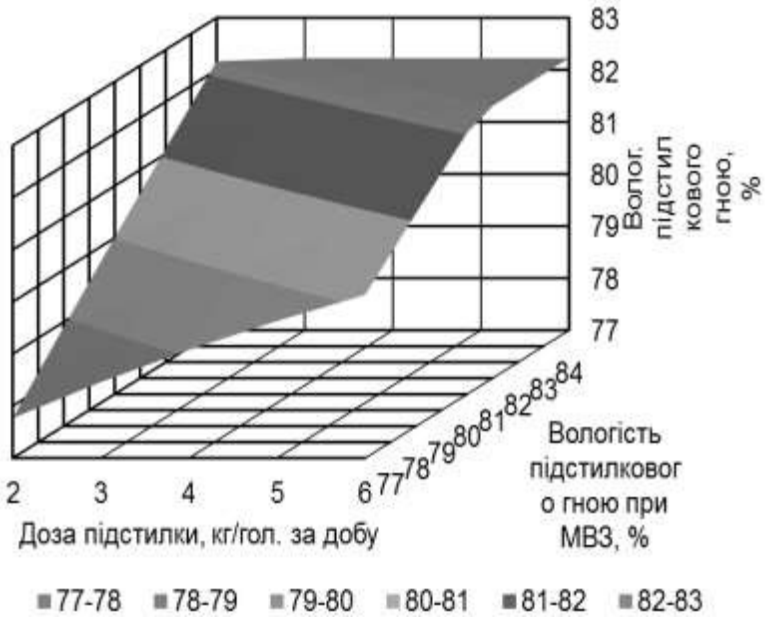


Ric. 2. Dependence of the moisture out hnoyivky litter manure at doses MVZ and bedding for the cows.

In thestanovleno that with increasing humidity making litter and litter manure at MVZ from 77 to 82% humidity litter manure increases in size from 1 to 1.5% (Fig. 3 for pigs and Fig. 4 for cows).



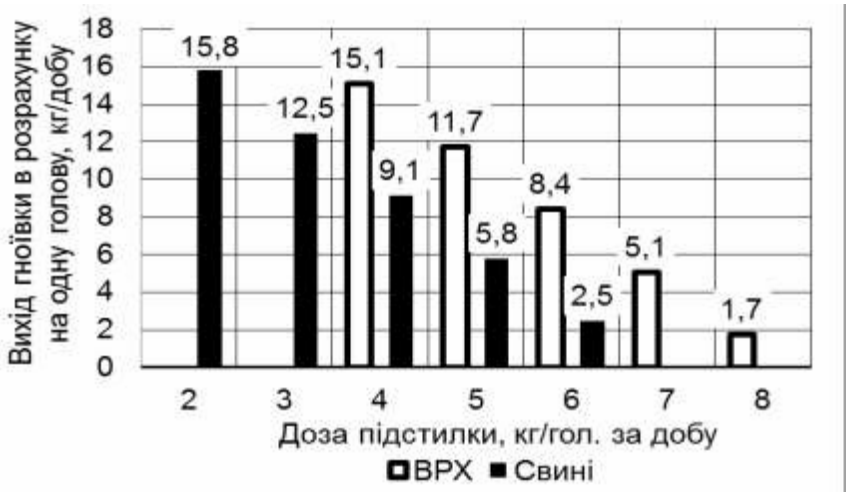
Ric. 3. Dependence of moisture from humidity litter manure litter manure at doses MVZ and litter.



Ric. 4. Dependence of moisture from humidity litter manure litter manure at doses MVZ and litter.

With increasing humidity litter manure at MVZ more than 82% of litter entering more than 3 kg / head per day has no significant effect on litter humidity cattle and pig manure. This is due to the fact that moisture litter manure reaches its critical point and the subsequent absorption of the liquid fraction is terminated.

Andwith increasing doses of litter, a decrease in output hnoyivky held constant humidity. Based on the resulting equation was constructed out hnoyivky depending on the type of animal in making various doses of litter size and maximum water-holding capacity of 80%
(Ric. 5).



Ric. 5. Dependence out hnoyivky dose of litter in the litter manure moisture that meets HBM at 80%.

AndThe graph shows that with increasing doses of litter observed minimize hnoyivky at constant values of humidity litter manure that meets HBM. For example, the daily use of litter in the amount of 4 kg / head., Exit hnoyivky be 15.1 kg / head. per day for cattle and 9.1 kg / head. per day for pigs, while increasing the dose of litter to 6 kg / head., respectively - 8.4 and 2.5 kg / head. per day.

Conclusion. In thestanovleni output patterns depending hnoyivky the dose litter allow manure management process of planning of further distribution of litter manure on aerobic fermentation tahnoyivky on anaerobic digestion in biogas plants with subsequent return to the process of composting litter manure.

References

1. *Arrohymyya* / Ed. *In the.M. Klechkovskii, AV Peterburhskoho*. - M .: Kolos, 1967. - 583 p.
2. *Arrohymyya* Question and Answer in / [*And.A. Kalykyn, Y.R. Vyldflush, VA Jonas et al.*]. - Minsk: Uradzhay, 1991. - 240 p.
3. *In theasylev VA* Cpravochnyk on udobrenyyam of organic / *In the.A. Vasilyev, NV Fylyppova* [2nd ed.] - M .: Rosahropromyzdat, 1988. - 255 p.
4. *In theasyutyn AS* Fromemledelye Russia: STATUS problem and / *And.S. Vasyutin* // Agriculture. - 1996. - № 3. - P. 4-5.
5. *Dolub GA*. Agro-industrial production of edible mushrooms. Technological bases of Mechanical / *D.A. Golub.* - K .: Agricultural Science, 2007. - 332 p.
6. *Dolhov VS* Dyhyena Other cleaning and utylyzatsyy manure / *In the.S. Dolgov.* - M .: Rosselhozyzdat, 1984. - 175 c.
7. *Dubrovyn VA* In theyrobnytstvo biogas from organic waste in terms of individual farms / *In the.O. Dubrovin, V. Mironenko VV Kryvoruchko, VI Tymoshenko IV Miller* // Scientific Bulletin of National University of Life and Environmental Sciences of Ukraine. - K., 2009. - Vol. 134, p. 2. - P. 96-100.
8. *Fromvyahyntsev DG* Modern Problems of ecology pochvennыh microorganisms / *D.H. Zvyahyntsev* // Mykrobyolohyya okruzhayuschey environment. - Almaty, 1980. - P. 65-78.
9. *Ler R.* Converting waste and Using selskohozyaystvennыh: Per. with the English. / Under.ed*. AN Champcueil*. - M .: Kolos, 1979. - 415 p.
10. *Metodycheskye* pekomendatsyy on designing systems Removal, Monitor, obezzarazhyvanyya, storage and manure and dung utylyzatsyy. - M .: KOlhos, 1983. - 61 p.
11. *Patent* Categoriesand utility model number 18512 Ukraine, IPC (2013.01) A01K 23/00.

The method of preparation and removal of litter manure to the recycling / *Dolub GA, Zabolodko OO Hmelovskyy VS, Maroussia OA* ; owner of the National University of Life and Environmental Sciences of Ukraine - Statements. 08.02.2012, And number 201201345; Publish. 10.07.2013, Bull. №13.

12. *Polischuk VM* Biotechnological bases biogas / *In the.M. Polishchuk, MN Lobotko, AV Dubrovin* // Scientific Bulletin of National University of Life and Environmental Sciences of Ukraine. - K., 2013. - Vol. 185, p. 2. - P. 289- 296.

13. *Pukovodstvo* to obtain from biogas to Using /: Ydentyfykatsyonnыy project number (FKZ / YNP): 22,005,108 / German Studies Centre byomassы Torgauer Straße 116- 04 347 Leipzig [5th completely rev. ed.] Hyultsov ,: yzdano Agency for vozobnovlyaemyh Resources (FNR) FechagenturNachwachsendeRohstoffee. V. 2010. - 214 p.
14. *Systems* toydalennya, processing, preparation, and use of manure VNTP-APC 09.06. Official. publication. - K .: Ministry of Agrarian Policy of Ukraine, 2006. - 100 p.
15. *Background* book on hymyzatsyy agricultural households, / [ed. *In the.M. Borisov*.] - 2nd ed., Rev. and add. - Moscow: Kolos, 1980. - 560 p.
16. *Technology* processing of biological waste into biogas plants with rotating reactor / [*Dolub GA, Sydorchuk OV Kuharets SM, et al.*]; eds. Dr. Sc. Science professor. *D.A. Dove*. - K .: Publishing House NUBiP Ukraine, 2014. - 106 p.
17. *Tyvo PF* Effective Using bespodstylochnoho manure / *P.F. Tyvo, SG Drobot.* - Minsk: Uradzhay, 1988. - 116 p.

Powered principle Control Remove manure at animal putem Content Changed dozy podstylky.

Navoznaya ace, Large rohatыy cattle, svyny, manure, humidity, podstylka.

The management principle of animals manure removal by changing of dose litter is given.

Aqua manure, cattle, pigs, manure, humidity, litter.

UDC
631.354.2

METODYKA CALCULATION OF GRAIN LOSS probably SMEs harvester Don-1500B

OA Demko, PhD
student *

Andnalitychno determined the probable value of mechanical losses depending on their areas for straw and reshitnym condition.

Zehrnozbyralni combayny, Sectionloscha, Section'Yezometrychni sensors, probability, numerical value estimate.

AnaLiz recent research. Most publications [1-6] ascertained only numeric values for mechanical losses threshing-separating device combine harvesters. The fact neither constitutes nor analyzed the system itself