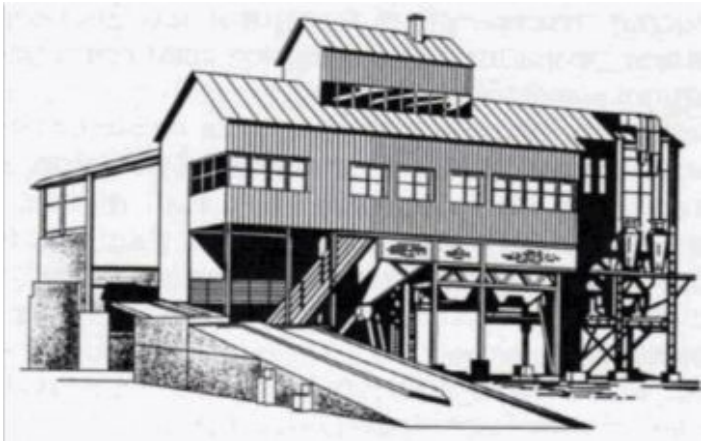
NATIONAL UNIVERSITY OF LIFE
AND ENVIRONMENTAL SCIENCES
OF UKRAINE

Faculty Agricultural Management

Storage, processing and plant product standardization
prof. B.V. Lesik department

Guidelines

the practical training of discipline
"Technology systems of production and processing of crop production:
“Technology processing and storage of agricultural products”



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Guidelines the practical training of discipline "Technology systems of production and processing of crop production: “Technology processing and storage of agricultural products” for students of faculty "Agricultural Management" was presented. Paper includes practical training program, its objectives and a short theoretical material to each of the sections. The guidelines have examples of calculations, which are held during storage of grains and vegetables and packages for independent tasks of these calculations students. This paper finished references list.

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Educational editions

Guidelines the practical training of discipline "Technology systems of production and processing of crop production: “Technology processing and storage of agricultural products”

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Preface

The practice of agriculture is the need to reduce postharvest losses during handling, storage and processing of agricultural product. The latter can be achieved as if a logistical base and highly qualified personnel.

A significant amount of future specialist agricultural production associated with the analysis of works on the assembly after adjusting harvest crop production in order to identify reserves, reducing labor expenses and facilities. Therefore, the expert must have good methods of use of postharvest treatment of grain, technical and other crops, as this work in the general production technology accounts for 50 % of expenses.

The future specialist must know the procedure to evaluate the quality of agricultural products, procuring organizations, so he must be familiar with the structure and operation of these enterprises.

To solve these issues aims to study the practice of discipline "Technology systems of production and processing of crop production: “Technology processing and storage of agricultural products”.

Subjects studied at the practice of supplementing the material on the subject "Technology systems of production and processing of crop production: “Technology processing and storage of agricultural products”. At the end of practice, students write down the report.

1. Practical training program

1.1. Task practice: to learn the preparation farms to receive new grain, determine the accounting of grain coming from the field to the barn floor, the method of calculating weight loss of grain due to changes in humidity and content admixtures, to visit the organizations that buy plant products, to payments for sold (purchased) products, get acquainted with postharvest handling technology of the grains, vegetables, fruits, technologies of bread production and vegetable pickling.

1.2. Objective practice: 18 hours for students studying agricultural management.

1.3. Content of practice.

The practice includes trial and technological part.

The trial part. This part is in the form of visiting classes directly in teaching and research facilities that are well-equipped complex cleaning and drying, canning factory, typical of the storehouse. Students get acquainted with the work of bakery, produce plant, feed and flax plans. Thus, the main section «Post-harvesting handling and storage of grain» are needed in practice:

Acquaintance with technologies of post-harvest handling of grain.

The first, these technologies applied in a particular space and time. In practice, always at any time, you can see different views, different content and quality of logistic bases.

By learning to study this section includes the following questions:

a) the quality of placement barn floors and its territories. When acquaintance with this part of the logistics of their marks:

- type (closed and opened);
- placement (location) (the angle slope, the presence of drainage system, etc.);
- capacity to accommodate different types of wastes after cleaning of grain, seed (pit, boxes, quality of accommodation);
- quality of ground cover (presence or absence of cracks, etc.).

b) the quality existing of grain and seed storehouse**.** With connections of the types of storehouse (training and research farming, grain-collection enterprises, farming enterprises of different forms of ownership) to explain the following:

- availability of documentation (standards) for grain quality and methods of its determination;
- type of granary, its components (storage in a bulk or section storage, the presence of other department);
- availability of waterproofing (quality roofing, installation of foundations, etc.);
- reliable protection against penetration of rodents, insects - pests of grain (placement of windows, the quality of walls, section, the presence of cracks);
- availability of devices for monitoring grain quality during storage (thermometers, psychometric, etc.);
- possibility of preventive and health measures;

- the degree of mechanization of works in granary (loading and un loading);
- the degree to prevent mixing of different types of grain (quality of accommodation of section).

c). Existence of firefighting tools:
- water intake (including equipment, which can be used);
- distance from the granary;
- availability of firefighting equipment (buckets, sand, etc.) his condition.

Acquaintance with storehouse for fodder.

By learning to study this section includes the following questions:
- size of storehouse and distance from livestock, device for measuring quality of hay, the availability of technical standards requirements of various grass hay;
- ways storage of straw wheat (for fodder) and winter wheat (for bedding);
- types of storehouse for silage, hay, availability of technical standards.

Getting acquaintance with the state of material-technical base for the storing tubers of potatoes, vegetables and fruits.

In teaching and research university farms and farms of different ownership forms to examine materially-technical base, including storehouse designed for projects, selecting:
• universal
• specialized (cabbage-, root-, onions and fruit storehouse).

Describe each type of storehouse:
- the main parts (actually place of storehouse, camera). Noting their size and arrangement of features (possible adjustment of temperature and humidity regime (refrigerators, with forced ventilation, etc.), methods of thermal insulation of walls, roofs, ways of storage (bulk, in containers);
- support facilities (fridge compartment, laboratories, storehouse for package, dressing, etc.);
- ways to deliver products in storehouse (auto, rail) and features unloading plants from lorry;
- presence of sorting, calibration, packing lines;
- types of containers are used for storage of products;
- availability of standards for products that procurement and selling.

Introduction to workshop (factory) for the processing of plant products: the mills, groats enterprises, cannery. For each processing enterprise we should note the following:
– trademark, productivity, raw material that processed;
– technical requirements for raw materials and finished products (flour, grouts, certain types of canned food, etc.);
– actual productivity of the processing line;
– peculiarities of functioning of individual parts processing lines.

In addition to each of the enterprises note:
– firefighting equipment;

– conditions for maintaining the sanitary control of production (availability ventilation, washing equipment, etc.);

– equipment for determination the quality of raw materials and finished products.

Technological part of practice include:

– direct participation of students in the processes of post-harvest treatment of plant products for storage and selling;

– participation in establishing plant products on long and short-term storage;

– payment for realized production;

– calculation of quantitative and qualitative account of grain in storage;

– calculations to write off losses of vegetable at storage;

– participation in the manufacture of bakery products;

– participation in making pickling vegetable products.

2. Organization of educational practice

1-st day – trial practice on the barn floor and grain storehouse. In addition, students are directly involved in conducting quantitative and qualitative account of grain.

2-nd day – familiarization with the available equipment and storage facilities for grain treatment, order selling of grain of different purpose and method of payment for grain sold.

3-rd day - way of the storage of grain elevators, the technology of high-quality flour at the mill (industrial or agricultural), the technology of combined mixed fodder. The calculation of product placements in repositories, knowledge of methods of calculating the weight loss of grain during storage, study methods of payments for selling raw materials of technical crops.

4-th day – review of order placement clamp with juicy products. Study sales order of potatoes and vegetables, methods of payment for products depending on its quality. The calculation of losses of vegetables and potatoes during the long storage.

5-th day – baking of bread and determination its quality according to the requirement of standards.

6-th day - making of pickling vegetable, estimation of its quality in accordance with state standards. Writing of an report. Test.

3. Individual tasks and methodological advice to their performance

According to the practical training program on the subject "Technology systems of production and processing of crop production: “Technology processing and storage of agricultural products” students get practical skills and perform individual tasks.

In options of methodical recommendations the variants of individual tasks are given. Every variant contains three tasks numbers.

3. 1. Individual (calculative) tasks

Variant 1

Payment of grain depend on its quality

Task 1. The company has received 150 tons of wheat grain and 150 tons buckwheat grain with following qualities:

Indexes	Crops	
	wheat	buckwheat
Humidity, %	16,0	17,0
Foreign material, %	2,5	7,5
Grain admixture, %	6,4	12,5
Grain-unit, g/l	730	-
Vitreous, %	76	-
Quantity of gluten, %	29	-
Quality of gluten, group	I	-
Infection by ticks, grade	I	I
Falling number, s	216	-
Mass fraction of kernel, %	-	70

Define: suitability of grain for reception, class of grain, purchase price of 1 ton of grain.

Calculate: acceptable weight of grain, value of acceptable weight, the actual cost of 1 ton of grain depending on its quality.

Natural losses of plant products during its storage

Task 2. Calculate the norm and natural losses of 5000 tones of potatoes, which were stored in clamps from 20 September till 12 April.

Qualitative-quantitative accounting of grain during its storage

Task 3. 340 tons of oats is storing in the elevator.

Results of grain movement in the economy and its quality.

Month	Incomings			Expenses			Monthly remains, t
	weight, t	humidity, %	foreign material, %	weight, t	humidity, %	foreign material, %	
July							
August	210	14,6	1,7				
September	130	14,9	1,4				
October							
November				175	14,5	1,7	
December				135	13,8	1,1	
January				27	14,2	1,2	
February							
March							
April							
May							
June							
Total	**340**			**337**			

1) Define the lost of grain weight during its storage due to the changes of humidity.

2) Define the lost of grain weight during its storage due to the changes of content of foreign material.

3) Define the average period of storage of grain and natural lost of weight for the total period of storage.

Variant 2

Payment of grain depend on its quality

Task 1. The company has received 550 tons of wheat grain and 175 tons of rye grain with following qualities:

Indexes	Crops	
	wheat	rye
Humidity, %	12,5	12,4
Foreign material, %	3,5	4,0
Grain admixture, %	12,5	14,4
Grain-unit, g/l	749	683
Vitreous, %	44	-
Quantity of gluten, %	28	-
Quality of gluten, group	2	-
Infection by ticks, grade	I	I
Falling number, s	185	194
Mass fraction of kernel, %	-	-

Define: suitability of grain for reception, class of grain, purchase price of 1 ton of grain.

Calculate: acceptable weight of grain, value of acceptable weight, the actual cost of 1 ton of grain depending on its quality.

Natural losses of plant products during its storage

Task 2. Calculate the norm and natural losses of 50 tons of carrots, which were stored in clamps with mixing of sand from 10 October till 20 January.

Qualitative-quantitative accounting of grain during its storage

Task 3. 38 tons of millet is storing in bags.

Results of grain movement in the economy and its quality.

Month	Incomings			Expenses			Monthly remains, t
	weight, t	humidity, %	foreign material, %	weight, t	humidity, %	foreign material, %	
July							
August	16,0	13,7	1,4				
September	22,0	13,6	1,2				
October							
November							
December							
January							
February							
March							
April				22,5	13,1	1,0	
May				15,2	13,1	0,9	
June							
Total	**38**			**37,7**			

1) Define the lost of grain weight during its storage due to the changes of humidity.

2) Define the lost of grain weight during its storage due to the changes of content of foreign material.

3) Define the average period of storage of grain and natural lost of weight for the total period of storage.

Variant 3

Payment of grain depend on its quality

Task 1. The company has received 500 tons of wheat grain and 225 tons of peas grain with following qualities:

Indexes	Crops	
	wheat	peas
Humidity, %	13,5	17,0
Foreign material, %	1	3
Grain admixture, %	6	17
Grain-unit, g/l	780	-
Vitreous, %	90	-
Quantity of gluten, %	31	-
Quality of gluten, group	1	-
Infection by ticks, grade	II	-
Falling number, s	235	-
Mass fraction of kernel, %	-	-

Define: suitability of grain for reception, class of grain, purchase price of 1 ton of grain.

Calculate: acceptable weight of grain, value of acceptable weight, the actual cost of 1 ton of grain depending on its quality.

Natural losses of plant products during its storage

Task 2. Calculate the norm and natural losses of 20 tons of beets, which was stored in storehouse without artificial cooling from 15 April till 20 March.

Qualitative-quantitative accounting of grain during its storage

Task 3. 70 tons of sorghum is storing in the bags.

Results of grain movement in the economy and its quality.

Month	Incomings			Expenses			Monthly remains, t
	weight, t	humidity, %	foreign material, %	weight, t	humidity, %	foreign material, %	
July							
August							
September	17	14,8	1,0				
October	21	14,6	0,8				
November	32	14,7	0,8				
December							
January							
February				15	14,7	0,8	
March				18	14,7	1,0	
April				36,8	14,3	0,8	
May							
June							
Total	**70**			**69,8**			

1) Define the lost of grain weight during its storage due to the changes of humidity.

2) Define the lost of grain weight during its storage due to the changes of content of foreign material.

3) Define the average period of storage of grain and natural lost of weight for the total period of storage.

Variant 4

Payment of grain depend on its quality

Task 1. The company has received 100 tons of wheat grain and 150 tons of oat grain with following qualities:

Indices	Crops	
	wheat	oat
Humidity, %	15,5	13,5
Foreign material, %	3	8
Grain admixture, %	7	12
Grain-unit, g/l	785	430
Vitreous, %	60	-
Quantity of gluten, %	30	-
Quality of gluten, group	II	-
Infection by ticks, grade	-	1
Falling number, s	200	-
Mass fraction of kernel, %	-	-

Define: suitability of grain for reception, class of grain, purchase price of 1 ton of grain.

Calculate: acceptable weight of grain, value of acceptable weight, the actual cost of 1 ton of grain depending on its quality.

Natural losses of plant products during its storage

Task 2. Calculate the norm and natural losses of 50 tons of white cabbage, which were stored in clamps from 14 November till 20 February.

Qualitative-quantitative accounting of grain during its storage

Task 3. 80 tons of rye is storing in bulk.

Results of grain movement in the economy and its quality.

Month	Incomings			Expenses			Monthly remains, t
	weight, t	humidity, %	foreign material, %	weight, t	humidity, %	foreign material, %	
July							
August	50	14,5	1,0				
September	20	14,2	0,8				
October	10	14,0	0,7				
November							
December							
January							
February							
March				30	13,5	0,8	
April				20	13,5	0,5	
May				29	14,0	0,5	
June							
Total	**80**			**79**			

1) Define the lost of grain weight during its storage due to the changes of humidity.

2) Define the lost of grain weight during its storage due to the changes of content of foreign material.

3) Define the average period of storage of grain and natural lost of weight for the total period of storage.

Variant 5

Payment of grain depend on its quality

Task 1. The company has received 320 tons of wheat grain and 125 tons millet grain of following qualities:

Indices	Crops	
	wheat	millet
Humidity, %	17,7	15,0
Foreign material, %	4,8	5
Grain admixture, %	9,4	10
Grain-unit, g/l	775	-
Vitreous, %	72	-
Quantity of gluten, %	33,2	-
Quality of gluten, group	I	-
Infection by ticks, grade	I	II
Falling number, s	272	-
Mass fraction of kernel, %	-	65

Define: suitability of grain for reception, class of grain, purchase price of 1 ton of grain.

Calculate: acceptable weight of grain, value of acceptable weight, the actual cost of 1 ton of grain depending on its quality.

Natural losses of plant products during its storage

Task 2. Calculate the norm and natural losses of 50 tons of winter apples, which were stored in the refrigerator from 17 November till 20 February.

Qualitative-quantitative accounting of grain during its storage

Task 3. 60 tons of wheat is storing in bulk.

Results of grain movement in the economy and its quality.

Month	Incomings			Expenses			Monthly remains, t
	weight, t	humidity, %	foreign material, %	weight, t	humidity, %	foreign material, %	
July	30	14,5	1,0				
August	20	14,2	0,8				
September	10	14,0	0,7				
October							
November							
December							
January				20	13,5	0,1	
February							
March							
April				15	14,0	0,1	
May				24	14,0	0,1	
June							
Total	**60**			**59,4**			

1) Define the lost of grain weight during its storage due to the changes of humidity.

2) Define the lost of grain weight during its storage due to the changes of content of foreign material.

3) Define the average period of storage of grain and natural lost of weight for the total period of storage.

Variant 6

Payment of grain depend on its quality

Task 1. The company has received 300 tons of wheat and 125 tons barley of following qualities:

Indices	Crops	
	wheat	barley
Humidity, %	17,8	14,5
Foreign material, %	3,2	1,5
Grain admixture, %	7,4	5
Grain-unit, g/l	760	578
Vitreous, %	70	-
Quantity of gluten, %	33	-
Quality of gluten, group	II	-
Infection by ticks, grade	-	-
Falling number, s	180	-
Mass fraction of kernel, %	-	90

Define: suitability of grain for reception, class of grain, purchase price of 1 ton of grain.

Calculate: acceptable weight of grain, value of acceptable weight, the actual cost of 1 ton of grain depending on its quality.

Natural losses of plant products during its storage

Task 2. Calculate the norm and natural losses of 30 tons of onions, which were stored in a stationary storehouse without artificial cooling from 10 September till 10 March.

Qualitative-quantitative accounting of grain during its storage

Task 3. 45 tons of peas is storing in bulk.

Results of grain movement in the economy and its quality.

Month	Incomings			Expenses			Monthly remains, t
	weight, t	humidity, %	foreign material, %	weight, t	humidity, %	foreign material, %	
July	15	16,8	1,5				
August	18	16,0	1,5				
September	12	16,5	1,5				
October							
November							
December				20	16,3	1,4	
January				15	16,3	1,4	
February				5	16,2	1,2	
March				4,83	16,2	1,2	
April							
May							
June							
Total	**45**			**44,83**			

1) Define the lost of grain weight during its storage due to the changes of humidity.

2) Define the lost of grain weight during its storage due to the changes of content of foreign material.

3) Define the average period of storage of grain and natural lost of weight for the total period of storage.

Variant 7

Payment of grain depend on its quality

Task 1. The company has received 250 tons of wheat and 65 tons of millet of following qualities:

Indices	Crops	
	wheat	millet
Humidity, %	18,5	17,0
Foreign material, %	4,5	8
Grain admixture, %	12,7	15,0
Grain-unit, g/l	765	-
Vitreous, %	74	-
Quantity of gluten, %	30,5	-
Quality of gluten, group	I	-
Infection by ticks, grade	-	I
Falling number, s	272	-
Mass fraction of kernel, %	-	65

Define: suitability of grain for reception, class of grain, purchase price of 1 ton of grain.

Calculate: acceptable weight of grain, value of acceptable weight, the actual cost of 1 ton of grain depending on its quality.

Natural losses of plant products during its storage

Task 2. Calculate the norm and natural losses of 150 tons of potatoes, which were stored in the specialized storehouse from 5 September till 15 December.

Qualitative-quantitative accounting of grain during its storage

Task 3. 25 tons of barley is storing in bulk.

Results of grain movement in the economy and its quality.

Month	Incomings			Expenses			Monthly remains, t
	weight, t	humidity, %	foreign material, %	weight, t	humidity, %	foreign material, %	
July							
August	15	14,3	1,7				
September	10	14,2	1,3				
October							
November							
December							
January							
February				5	14,0	1,5	
March				12	14,0	1,4	
April				7,87	14,1	1,4	
May							
June							
Total	**25**			**24,87**			

1) Define the lost of grain weight during its storage due to the changes of humidity.

2) Define the lost of grain weight during its storage due to the changes of content of foreign material.

3) Define the average period of storage of grain and natural lost of weight for the total period of storage.

Variant 8

Payment of grain depend on its quality

Task 1. The company has received 500 tons of wheat and 5 tons buckwheat of following qualities:

Indices	Crops	
	wheat	buckwheat
Humidity, %	17,0	17,0
Foreign material, %	2,6	5,5
Grain admixture, %	7,6	4,0
Grain-unit, g/l	760	-
Vitreous, %	66	-
Quantity of gluten, %	36	-
Quality of gluten, group	I	-
Infection by ticks, grade	-	I
Falling number, s	220	-
Mass fraction of kernel, %	-	75
Viability,%	-	-

Define: suitability of grain for reception, class of grain, purchase price of 1 ton of grain.

Calculate: acceptable weight of grain, value of acceptable weight, the actual cost of 1 ton of grain depending on its quality.

Natural losses of plant products during its storage

Task 2. Calculate the norm and natural losses of 40 tons of beets, which were stored in clamps from 19 October till 11 March.

Qualitative-quantitative accounting of grain during its storage

Task 3. 200 tons of wheat is storing in elevator.

Results of grain movement in the economy and its quality.

Month	Incomings			Expenses			Monthly remains, t
	weight, t	humidity, %	foreign material, %	weight, t	humidity, %	foreign material, %	
July	54,5	16,2	2,0				
August	62,8	15,8	1,5				
September							
October	46,7	15,0	1,2				
November	36	14,5	0,8				
December				35	13,5	1,5	
January				42,5	14,5	1,0	
February				48	14,2	1,0	
March				50	13,5	0,6	
April				19,5	13,0	0,5	
May							
June							
Total	**200**			**195**			

1) Define the lost of grain weight during its storage due to the changes of humidity.

2) Define the lost of grain weight during its storage due to the changes of content of foreign material.

3) Define the average period of storage of grain and natural lost of weight for the total period of storage.

Variant 9

Payment of grain depend on its quality

Task 1. The company has received 350 tons of wheat and 120 tons of soybeans of following qualities:

Indices	Crops	
	wheat	soybean
Humidity, %	17,5	17,0
Foreign material, %	3,7	10,0
Grain admixture, %	11,4	10,0
Grain-unit, g/l	730	-
Vitreous, %	48	-
Quantity of gluten, %	28,7	-
Quality of gluten, group	II	-
Infection by ticks, grade	-	II
Falling number, s	175	-

Define: suitability of grain for reception, class of grain, purchase price of 1 ton of grain.

Calculate: acceptable weight of grain, value of acceptable weight, the actual cost of 1 ton of grain depending on its quality.

Natural losses of plant products during its storage

Task 2. Calculate the norm and natural losses of 15 tons of garlic, which was stored in a stationary storehouse without artificial cooling from 12 September till 15 January.

Qualitative-quantitative accounting of grain during its storage

Task 3. 23 tons of sunflower is storing in the bags.

Results of grain movement in the economy and its quality.

Month	Incomings			Expenses			Monthly remains, t
	weight, t	humidity, %	foreign material, %	weight, t	humidity, %	foreign material, %	
July							
August							
September							
October	12	8,2	1,1				
November	6	7,8	1,0				
December	5	7,3	1,1				
January							
February							
March				7	7,5	1,0	
April				11	7,3	0,9	
May				4,8	7,0	1,0	
June							
Total	**23**			**22,8**			

1) Define the lost of grain weight during its storage due to the changes of humidity.

2) Define the lost of grain weight during its storage due to the changes of content of foreign material.

3) Define the average period of storage of grain and natural lost of weight for the total period of storage.

Variant 10

Payment of grain depend on its quality

Task 1. The company has received 220 tons of wheat and 67 tons of maize of following qualities:

Indices	Crops	
	wheat	maize
Humidity, %	17,8	20,2
Foreign material, %	4,7	5,8
Grain admixture, %	12,4	9,8
Grain-unit, g/l	777	-
Vitreous, %	64	-
Quantity of gluten, %	30,2	-
Quality of gluten, group	II	-
Infection by ticks, grade	I	I
Falling number, s	210	-
Mass fraction of kernel, %	-	-

Define: suitability of grain for reception, class of grain, purchase price of 1 ton of grain.

Calculate: acceptable weight of grain, value of acceptable weight, the actual cost of 1 ton of grain depending on its quality.

Natural losses of plant products during its storage

Task 2. Calculate the norm and natural losses of 1000 tones of potatoes, which was stored in the specialized storehouse from 10 October till 15 March.

Qualitative-quantitative accounting of grain during its storage

Task 3. 65 tons of corn cob is storing in bulk.

Results of grain movement in the economy and its quality.

Month	Incomings			Expenses			Monthly remains, t
	weight, t	humidity, %	foreign material, %	weight, t	humidity, %	foreign material, %	
July							
August							
September							
October							
November	25	23	1,2				
December	40	23,5	1,1				
January							
February							
March							
April				35	22,5	1,0	
May				28,2	20,7	0,9	
June							
Total	**65**			**63,2**			

1) Define the lost of grain weight during its storage due to the changes of humidity.

2) Define the lost of grain weight during its storage due to the changes of content of foreign material.

3) Define the average period of storage of grain and natural lost of weight for the total period of storage.

Variant 11

Payment of grain depend on its quality

Task 1. The company has received 255 tons of wheat and 85 tons of oats for malt of following qualities:

Indices	Crops	
	wheat	oat
Humidity, %	18,5	14,0
Foreign material, %	4,2	1,0
Grain admixture, %	9,5	10,0
Grain-unit, g/l	772	420
Vitreous, %	69	-
Quantity of gluten, %	33,2	-
Quality of gluten, group	I	-
Infection by ticks, grade	I	II
Falling number, s	274	-
Mass fraction of kernel, %	-	-

Define: suitability of grain for reception, class of grain, purchase price of 1 ton of grain.

Calculate: acceptable weight of grain, value of acceptable weight, the actual cost of 1 ton of grain depending on its quality.

Natural losses of plant products during its storage

Task 2. Calculate the norm and natural losses of 1000 tones of potatoes, which was stored in clamps from 30 September till 10 April.

Qualitative-quantitative accounting of grain during its storage

Task 3. 340 tons of oats is storing in the bulk.

Results of grain movement in the economy and its quality.

Month	Incomings			Expenses			Monthly remains, t
	weight, t	humidity, %	foreign material, %	weight, t	humidity, %	foreign material, %	
July							
August	210	14,6	1,7				
September	130	14,9	1,4				
October							
November				175	14,5	1,7	
December				135	13,8	1,2	
January				27	14,2	1,7	
February							
March							
April							
May							
June							
Total	**340**			**337**			

1) Define the lost of grain weight during its storage due to the changes of humidity.

2) Define the lost of grain weight during its storage due to the changes of content of foreign material.

3) Define the average period of storage of grain and natural lost of weight for the total period of storage.

Variant 12

Payment of grain depend on its quality

Task 1. The company has received 400 tons of wheat and 100 tons of oats seeds of following qualities:

Indices	Crops	
	wheat	oat
Humidity, %	18,5	16,0
Foreign material, %	3,5	4,0
Grain admixture, %	12,0	11,3
Grain-unit, g/l	735	555
Vitreous, %	68	-
Quantity of gluten, %	30	-
Quality of gluten, group	I	-
Infection by ticks, grade	I	I
Falling number, s	222	-
Mass fraction of kernel, %	-	-

Define: suitability of grain for reception, class of grain, purchase price of 1 ton of grain.

Calculate: acceptable weight of grain, value of acceptable weight, the actual cost of 1 ton of grain depending on its quality.

Natural losses of plant products during its storage

Task 2. Calculate the norm and the natural loss of 500 tons of carrots, which were stored in clamps with mixing of sand from 15 October till 20 January.

Qualitative-quantitative accounting of grain during its storage

Task 3. 38 tons of millet is storing in bags.

Results of grain movement in the economy and its quality.

Month	Incomings			Expenses			Monthly remains, t
	weight, t	humidity, %	foreign material, %	weight, t	humidity, %	foreign material, %	
July							
August	1,6	13,7	1,1				
September	2,2	13,6	1,2				
October							
November							
December							
January							
February							
March							
April				2,25	13,1	1,0	
May				1,52	13,1	0,9	
June							
Total	**3,8**			**3,77**			

1) Define the lost of grain weight during its storage due to the changes of humidity.

2) Define the lost of grain weight during its storage due to the changes of content of foreign material.

3) Define the average period of storage of grain and natural lost of weight for the total period of storage.

Variant 13

Payment of grain depend on its quality

Task 1. The company has received 175 tons of wheat and 125 tons of maize seeds for baby food of following qualities:

Indices	Crops	
	wheat	maize
Humidity, %	16,7	17,0
Foreign material, %	4,8	5,0
Grain admixture, %	9,6	12,0
Grain-unit, g/l	769	-
Vitreous, %	70,8	-
Quantity of gluten, %	30,7	-
Quality of gluten, group	I	-
Infection by ticks, grade	II	I
Falling number, s	256	-
Mass fraction of kernel, %	-	-

Define: suitability of grain for reception, class of grain, purchase price of 1 ton of grain.

Calculate: acceptable weight of grain, value of acceptable weight, the actual cost of 1 ton of grain depending on its quality.

Natural losses of plant products during its storage

Task 2. Calculate the norm and natural losses of 20 tons of beets, which were stored in storehouse without artificial cooling from 10 September till 25 March.

Qualitative-quantitative accounting of grain during its storage

Task 3. 800 tons of rye is storing in bulk.

Results of grain movement in the economy and its quality.

Month	Incomings			Expenses			Monthly remains, t
	weight, t	humidity, %	foreign material, %	weight, t	humidity, %	foreign material, %	
July							
August	500	14,5	1,0				
September	200	14,2	0,8				
October	100	14,0	0,7				
November							
December							
January							
February							
March				300	13,5	0,8	
April				200	13,5	0,5	
May				290	14,0	0,5	
June							
Total	**800**			**790**			

1) Define the lost of grain weight during its storage due to the changes of humidity.

2) Define the lost of grain weight during its storage due to the changes of content of foreign material.

3) Define the average period of storage of grain and natural lost of weight for the total period of storage.

Variant 14

Payment of grain depend on its quality

Task 1. The company has received 300 tons of wheat and 125 tons of brewing barley of following qualities:

Indices	Crops	
	wheat	barley
Humidity, %	18,3	15,3
Foreign material, %	3,5	5,3
Grain admixture, %	7,5	8,3
Grain-unit, g/l	750	-
Vitreous, %	70	-
Quantity of gluten, %	31	-
Quality of gluten, group	I	-
Infection by ticks, grade	I	-
Falling number, s	240	-
Mass fraction of kernel, %	-	-
Viability,%	-	95,2
Protein content,%	14	10

Define: suitability of grain for reception, class of grain, purchase price of 1 ton of grain.

Calculate: acceptable weight of grain, value of acceptable weight, the actual cost of 1 ton of grain depending on its quality.

Natural losses of plant products during its storage

Task 2. Calculate the norm and natural losses of 50 tons of white cabbage, which were stored in clamps from 5 November till 10 February.

Qualitative-quantitative accounting of grain during its storage

Task 3. 500 tons of rye is storing in the elevator.

Results of grain movement in the economy and its quality.

Month	Incomings			Expenses			Monthly remains, t
	weight, t	humidity, %	foreign material, %	weight, t	humidity, %	foreign material, %	
July							
August	300	14,5	1,0				
September	200	14,2	0,8				
October	100	14,0	0,7				
November							
December							
January							
February							
March				250	13,5	0,8	
April				200	13,5	0,5	
May				48	14,0	0,5	
June							
Total	**500**			**498**			

1) Define the lost of grain weight during its storage due to the changes of humidity.

2) Define the lost of grain weight during its storage due to the changes of content of foreign material.

3) Define the average period of storage of grain and natural lost of weight for the total period of storage.

Variant 15

Payment of grain depend on its quality

Task 1. The company has received 650 tons of wheat and 42 tons of peas seeds of following qualities:

Indices	Crops	
	wheat	pea
Humidity, %	18,0	15,0
Foreign material, %	3,0	4,0
Grain admixture, %	6,0	10,0
Grain-unit, g/l	772	-
Vitreous, %	63,0	-
Quantity of gluten, %	28,5	-
Quality of gluten, group	II	-
Infection by ticks, grade	II	II
Falling number, s	178	-
Mass fraction of kernel, %	-	-
Viability,%	-	-

Define: suitability of grain for reception, class of grain, purchase price of 1 ton of grain.

Calculate: acceptable weight of grain, value of acceptable weight, the actual cost of 1 ton of grain depending on its quality.

Natural losses of plant products during its storage

Task 2. Calculate the norm and natural losses of 50 tons of winter varieties of apples which were stored in the fridge from 10 November till 25 February.

Qualitative-quantitative accounting of grain during its storage

Task 3. 600 tons of rye is storing in elevator.

Results of grain movement in the economy and its quality.

Month	Incomings			Expenses			Monthly remains, t
	weight, t	humidity, %	foreign material, %	weight, t	humidity, %	foreign material, %	
July							
August	350	14,0	1,1				
September	200	14,2	0,9				
October	50	14,4	0,8				
November							
December							
January							
February							
March				250	13,5	0,9	
April				200	14,0	0,7	
May				140	13,3	0,6	
June							
Total	**600**			**590**			

1) Define the lost of grain weight during its storage due to the changes of humidity.

2) Define the lost of grain weight during its storage due to the changes of content of foreign material.

3) Define the average period of storage of grain and natural lost of weight for the total period of storage.

Variant 16

Payment of grain depend on its quality

Task 1. The company has received 125 tons of wheat and 225 tons of brewing barley of following qualities:

Indices	Crops	
	wheat	barley
Humidity, %	17,3	16,3
Foreign material, %	3,5	5,3
Grain admixture, %	7,5	8,3
Grain-unit, g/l	740	-
Vitreous, %	70	-
Quantity of gluten, %	31	-
Quality of gluten, group	II	-
Infection by ticks, grade	II	-
Falling number, s	240	-
Mass fraction of kernel, %	-	-
Viability,%	-	93,2
Protein content,%	14	10

Define: suitability of grain for reception, class of grain, purchase price of 1 ton of grain.

Calculate: acceptable weight of grain, value of acceptable weight, the actual cost of 1 ton of grain depending on its quality.

Natural losses of plant products during its storage

Task 2. Calculate the norm and natural losses of 30 tons of onions which were story in a stationary storehouse without artificial cooling from 5 September till 5 March.

Qualitative-quantitative accounting of grain during its storage

Task 3. 800 tons of wheat is storing in bulk.

Results of grain movement in the economy and its quality.

Month	Incomings			Expenses			Monthly remains, t
	weight, t	humidity, %	foreign material, %	weight, t	humidity, %	foreign material, %	
July							
August	350	14,0	1,2				
September	200	14,2	1,4				
October	250	14,4	0,8				
November							
December							
January							
February				200	13,8	0,7	
March				250	14,0	0,9	
April				200	14,0	0,7	
May				140	13,3	0,6	
June							
Total	**800**			**790**			

1) Define the lost of grain weight during its storage due to the changes of humidity.

2) Define the lost of grain weight during its storage due to the changes of content of foreign material.

3) Define the average period of storage of grain and natural lost of weight for the total period of storage.

Variant 17

Payment of grain depend on its quality

Task 1. The company has received 1150 tons of wheat grain and 150 tons buckwheat grain with following qualities:

Indexes	Crops	
	wheat	buckwheat
Humidity, %	16,0	17,0
Foreign material, %	2,5	7,5
Grain admixture, %	6,4	12,5
Grain-unit, g/l	730	-
Vitreous, %	76	-
Quantity of gluten, %	29	-
Quality of gluten, group	I	-
Infection by ticks, grade	I	I
Falling number, s	216	-
Mass fraction of kernel, %	-	70

Define: suitability of grain for reception, class of grain, purchase price of 1 ton of grain.

Calculate: acceptable weight of grain, value of acceptable weight, the actual cost of 1 ton of grain depending on its quality.

Natural losses of plant products during its storage

Task 2. Calculate the norm and the natural losses of 150 tons of potatoes, which were stored in the specialized storehouse from 15 September till 15 December.

Qualitative-quantitative accounting of grain during its storage

Task 3. 600 tons of wheat is storing in the elevator.

Results of grain movement in the economy and its quality.

Month	Incomings			Expenses			Monthly remains, t
	weight, t	humidity, %	foreign material, %	weight, t	humidity, %	foreign material, %	
July							
August	350	14,0	1,2				
September	200	14,2	1,4				
October	50	14,4	0,8				
November							
December							
January							
February				200	13,8	0,7	
March				250	14,0	0,9	
April				140	14,0	0,7	
May							
June							
Total	**600**			**590**			

1) Define the lost of grain weight during its storage due to the changes of humidity.

2) Define the lost of grain weight during its storage due to the changes of content of foreign material.

3) Define the average period of storage of grain and natural lost of weight for the total period of storage.

Variant 18

Payment of grain depend on its quality

Task 1. The company has received 1250 tons of wheat grain and 50 tons buckwheat grain with following qualities:

Indexes	Crops	
	wheat	buckwheat
Humidity, %	16,0	17,0
Foreign material, %	2,5	7,5
Grain admixture, %	6,4	12,5
Grain-unit, g/l	730	-
Vitreous, %	76	-
Quantity of gluten, %	29	-
Quality of gluten, group	I	-
Infection by ticks, grade	I	I
Falling number, s	216	-
Mass fraction of kernel, %	-	70

Define: suitability of grain for reception, class of grain, purchase price of 1 ton of grain.

Calculate: acceptable weight of grain, value of acceptable weight, the actual cost of 1 ton of grain depending on its quality.

Natural losses of plant products during its storage

Task 2. Calculate the norm and natural losses of 40 tons of beets, which were stored in clamps from 10 October till 14 March.

Qualitative-quantitative accounting of grain during its storage

Task 3. 600 tons of wheat is storing in bulk.

Results of grain movement in the economy and its quality.

Month	Incomings			Expenses			Monthly remains, t
	weight, t	humidity, %	foreign material, %	weight, t	humidity, %	foreign material, %	
July							
August	350	14,0	1,2				
September	200	14,2	1,4				
October	50	14,4	0,8				
November							
December							
January							
February				200	13,8	0,7	
March				250	14,0	0,9	
April				140	14,0	0,7	
May							
June							
Total	**600**			**590**			

1) Define the lost of grain weight during its storage due to the changes of humidity.

2) Define the lost of grain weight during its storage due to the changes of content of foreign material.

3) Define the average period of storage of grain and natural lost of weight for the total period of storage.

Variant 19

Payment of grain depend on its quality

Task 1. The company has received 150 tons of wheat grain and 150 tons oats grain with following qualities:

Indexes	Crops	
	wheat	oat
Humidity, %	16,0	17,0
Foreign material, %	2,5	7,5
Grain admixture, %	6,4	12,5
Grain-unit, g/l	730	-
Vitreous, %	76	-
Quantity of gluten, %	29	-
Quality of gluten, group	I	-
Infection by ticks, grade	I	I
Falling number, s	216	-
Mass fraction of kernel, %	-	70

Define: suitability of grain for reception, class of grain, purchase price of 1 ton of grain.

Calculate: acceptable weight of grain, value of acceptable weight, the actual cost of 1 ton of grain depending on its quality.

Natural losses of plant products during its storage

Task 2. Calculate the norm and natural losses of 15 tons of garlic, which was stored in a stationary storehouse without artificial cooling from 20 September till 25 January.

Qualitative-quantitative accounting of grain during its storage

Task 3. 340 tons of oat is storing in bulk.

Results of grain movement in the economy and its quality.

Month	Incomings			Expenses			Monthly remains, t
	weight, t	humidity, %	foreign material, %	weight, t	humidity, %	foreign material, %	
July							
August	210	14,6	1,7				
September	130	14,9	1,4				
October							
November				175	14,5	1,7	
December				135	13,8	1,3	
January				27	14,2	1,3	
February							
March							
April							
May							
June							
Total	**340**			**337**			

1) Define the lost of grain weight during its storage due to the changes of humidity.

2) Define the lost of grain weight during its storage due to the changes of content of foreign material.

3) Define the average period of storage of grain and natural lost of weight for the total period of storage.

Variant 20

Payment of grain depend on its quality

Task 1. The company has received 545 tons of wheat grain and 150 tons oat grain with following qualities:

Indexes	Crops	
	wheat	oat
Humidity, %	16,0	17,0
Foreign material, %	2,5	7,5
Grain admixture, %	6,4	12,5
Grain-unit, g/l	730	-
Vitreous, %	76	-
Quantity of gluten, %	29	-
Quality of gluten, group	I	-
Infection by ticks, grade	I	I
Falling number, s	216	-
Mass fraction of kernel, %	-	70

Define: suitability of grain for reception, class of grain, purchase price of 1 ton of grain.

Calculate: acceptable weight of grain, value of acceptable weight, the actual cost of 1 ton of grain depending on its quality.

Natural losses of plant products during its storage

Task 2. Calculate the norm and natural losses of 5000 tones of potatoes, which were stored in the specialized storehouse from 17 October till 15 March.

Qualitative-quantitative accounting of grain during its storage

Task 3. 37 tons of millet is storing in bulk.

Results of grain movement in the economy and its quality.

Month	Incomings			Expenses			Monthly remains, t
	weight, t	humidity, %	foreign material, %	weight, t	humidity, %	foreign material, %	
July							
August	16,0	13,7	1,4				
September	22,0	13,6	1,2				
October							
November							
December							
January							
February							
March							
April				22,5	13,1	1,0	
May				15,2	13,1	0,9	
June							
Total	**38**			**37,7**			

1) Define the lost of grain weight during its storage due to the changes of humidity.

2) Define the lost of grain weight during its storage due to the changes of content of foreign material.

3) Define the average period of storage of grain and natural lost of weight for the total period of storage.

Variant 21

Payment of grain depend on its quality

Task 1. The company has received 780 tons of wheat grain and 150 tons sunflower grain with following qualities:

Indexes	Crops	
	wheat	sunflower
Humidity, %	16,0	17,0
Foreign material, %	2,5	7,5
Grain admixture, %	6,4	12,5
Grain-unit, g/l	730	-
Vitreous, %	76	-
Quantity of gluten, %	29	-
Quality of gluten, group	I	-
Infection by ticks, grade	I	I
Falling number, s	216	-
Mass fraction of kernel, %	-	70

Define: suitability of grain for reception, class of grain, purchase price of 1 ton of grain.

Calculate: acceptable weight of grain, value of acceptable weight, the actual cost of 1 ton of grain depending on its quality.

Natural losses of plant products during its storage

Task 2. Calculate the norm and natural losses of 650 tons of potatoes, which were stored in clamps from 10 September till 19 April.

Qualitative-quantitative accounting of grain during its storage

Task 3. 70 tons of sorghum is storing in bulk.

Results of grain movement in the economy and its quality.

Month	Incomings			Expenses			Monthly remains, t
	weight, t	humidity, %	foreign material, %	weight, t	humidity, %	foreign material, %	
July							
August							
September	17	14,8	1,0				
October	21	14,6	0,8				
November	32	14,7	0,8				
December							
January							
February				15	14,7	0,8	
March				18	14,7	1,0	
April				36,8	14,3	0,8	
May							
June							
Total	**70**			**69,8**			

1) Define the lost of grain weight during its storage due to the changes of humidity.

2) Define the lost of grain weight during its storage due to the changes of content of foreign material.

3) Define the average period of storage of grain and natural lost of weight for the total period of storage.

Variant 22

Payment of grain depend on its quality

Task 1. The company has received 224 tons of wheat grain and 178 tons barley grain with following qualities:

Indexes	Crops	
	wheat	barley
Humidity, %	16,0	17,0
Foreign material, %	2,5	7,5
Grain admixture, %	6,4	12,5
Grain-unit, g/l	730	-
Vitreous, %	76	-
Quantity of gluten, %	29	-
Quality of gluten, group	I	-
Infection by ticks, grade	I	I
Falling number, s	216	-
Mass fraction of kernel, %	-	70

Define: suitability of grain for reception, class of grain, purchase price of 1 ton of grain.

Calculate: acceptable weight of grain, value of acceptable weight, the actual cost of 1 ton of grain depending on its quality.

Natural losses of plant products during its storage

Task 2. Calculate the norm and natural losses of 50 tons of carrots, which were stored in clamps with mixing of sand from 20 October till 20 January.

Qualitative-quantitative accounting of grain during its storage

Task 3. 45 tons of peas is storing in the bags.

Results of grain movement in the economy and its quality.

Month	Incomings			Expenses			Monthly remains, t
	weight, t	humidity, %	foreign material, %	weight, t	humidity, %	foreign material, %	
July	15	16,8	1,5				
August	18	16,0	1,5				
September	12	16,5	1,5				
October							
November							
December				20	16,3	1,4	
January				15	16,3	1,4	
February				5	16,2	1,2	
March				4,83	16,2	1,2	
April							
May							
June							
Total	**45**			**44,83**			

1) Define the lost of grain weight during its storage due to the changes of humidity.

2) Define the lost of grain weight during its storage due to the changes of content of foreign material.

3) Define the average period of storage of grain and natural lost of weight for the total period of storage.

Variant 23

Payment of grain depend on its quality

Task 1. The company has received 630 tons of wheat grain and 150 tons oat grain with following qualities:

Indexes	Crops	
	wheat	oat
Humidity, %	16,0	17,0
Foreign material, %	2,5	7,5
Grain admixture, %	6,4	12,5
Grain-unit, g/l	730	-
Vitreous, %	76	-
Quantity of gluten, %	29	-
Quality of gluten, group	I	-
Infection by ticks, grade	I	I
Falling number, s	216	-
Mass fraction of kernel, %	-	70

Define: suitability of grain for reception, class of grain, purchase price of 1 ton of grain.

Calculate: acceptable weight of grain, value of acceptable weight, the actual cost of 1 ton of grain depending on its quality.

Natural losses of plant products during its storage

Task 2. Calculate the norm and natural losses of 200 tons of beets, which were stored in storehouse without artificial cooling from 10 September till 25 March.

Qualitative-quantitative accounting of grain during its storage

Task 3. 23 tons of sunflower is storing in the elevator.

Results of grain movement in the economy and its quality.

Month	Incomings			Expenses			Monthly remains, t
	weight, t	humidity, %	foreign material, %	weight, t	humidity, %	foreign material, %	
July							
August							
September							
October	12	8,2	1,1				
November	6	7,8	1,0				
December	5	7,3	1,1				
January							
February							
March				7	7,5	1,0	
April				11	7,3	0,9	
May				4,8	7,0	1,0	
June							
Total	**23**			**22,8**			

1) Define the lost of grain weight during its storage due to the changes of humidity.

2) Define the lost of grain weight during its storage due to the changes of content of foreign material.

3) Define the average period of storage of grain and natural lost of weight for the total period of storage.

Variant 24

Payment of grain depend on its quality

Task 1. The company has received 248 tons of wheat grain and 150 tons pea grain with following qualities:

Indexes	Crops	
	wheat	pea
Humidity, %	16,0	17,0
Foreign material, %	2,5	7,5
Grain admixture, %	6,4	12,5
Grain-unit, g/l	730	-
Vitreous, %	76	-
Quantity of gluten, %	29	-
Quality of gluten, group	I	-
Infection by ticks, grade	I	I
Falling number, s	216	-
Mass fraction of kernel, %	-	70

Define: suitability of grain for reception, class of grain, purchase price of 1 ton of grain.

Calculate: acceptable weight of grain, value of acceptable weight, the actual cost of 1 ton of grain depending on its quality.

Natural losses of plant products during its storage

Task 2. Calculate the norm and natural losses of 500 tones of white cabbage, which were stored in clamp from 10 November till 12 February.

Qualitative-quantitative accounting of grain during its storage

Task 3. 23 tons of sunflowers is storing in bulk.

Results of grain movement in the economy and its quality.

Month	Incomings			Expenses			Monthly remains, t
	weight, t	humidity, %	foreign material, %	weight, t	humidity, %	foreign material, %	
July							
August							
September							
October	12	8,2	1,1				
November	6	7,8	1,0				
December	5	7,3	1,1				
January							
February							
March				7	7,5	1,0	
April				11	7,3	0,9	
May				4,8	7,0	1,0	
June							
Total	**23**			**22,8**			

1) Define the lost of grain weight during its storage due to the changes of humidity.

2) Define the lost of grain weight during its storage due to the changes of content of foreign material.

3) Define the average period of storage of grain and natural lost of weight for the total period of storage.

Variant 25

Payment of grain depend on its quality

Task 1. The company has received 170 tons of wheat grain and 340 tons buckwheat grain with following qualities:

Indexes	Crops	
	wheat	buckwheat
Humidity, %	16,0	17,0
Foreign material, %	2,5	7,5
Grain admixture, %	6,4	12,5
Grain-unit, g/l	730	-
Vitreous, %	76	-
Quantity of gluten, %	29	-
Quality of gluten, group	I	-
Infection by ticks, grade	I	I
Falling number, s	216	-
Mass fraction of kernel, %	-	70

Define: suitability of grain for reception, class of grain, purchase price of 1 ton of grain.

Calculate: acceptable weight of grain, value of acceptable weight, the actual cost of 1 ton of grain depending on its quality.

Natural losses of plant products during its storage

Task 2. Calculate the norm and natural losses of 5 tons of winter varieties of apples which were stored in the fridge from 15 November till 20 February.

Qualitative-quantitative accounting of grain during its storage

Task 3. 25 tons of buckwheat is storing in the bags.

Results of grain movement in the economy and its quality.

Month	Incomings			Expenses			Monthly remains, t
	weight, t	humidity, %	foreign material, %	weight, t	humidity, %	foreign material, %	
July							
August							
September							
October	15	14,2	1,1				
November	5	14,8	1,0				
December	5	14,3	1,1				
January							
February							
March				8	14,0	1,0	
April				12	14,1	0,9	
May				4,8	14,1	1,0	
June							
Total	**25**			**24,8**			

1) Define the lost of grain weight during its storage due to the changes of humidity.

2) Define the lost of grain weight during its storage due to the changes of content of foreign material.

3) Define the average period of storage of grain and natural lost of weight for the total period of storage.

Variant 26

Payment of grain depend on its quality

Task 1. The company has received 670 tons of wheat grain and 237 tons barley grain with following qualities:

Indexes	Crops	
	wheat	barley
Humidity, %	16,0	17,0
Foreign material, %	2,5	7,5
Grain admixture, %	6,4	12,5
Grain-unit, g/l	730	-
Vitreous, %	76	-
Quantity of gluten, %	29	-
Quality of gluten, group	I	-
Infection by ticks, grade	I	I
Falling number, s	216	-
Mass fraction of kernel, %	-	70

Define: suitability of grain for reception, class of grain, purchase price of 1 ton of grain.

Calculate: acceptable weight of grain, value of acceptable weight, the actual cost of 1 ton of grain depending on its quality.

Natural losses of plant products during its storage

Task 2. Calculate the norm and natural losses of 30 tons of onions which were stored in a stationary storehouse without artificial cooling from 20 September till 10 March.

Qualitative-quantitative accounting of grain during its storage

Task 3. 25 tons of buckwheat is storing in bulk.

Results of grain movement in the economy and its quality.

Month	Incomings			Expenses			Monthly remains, t
	weight, t	humidity, %	foreign material, %	weight, t	humidity, %	foreign material, %	
July							
August							
September							
October	15	14,2	1,1				
November	5	14,8	1,0				
December	5	14,3	1,1				
January							
February							
March				8	14,0	1,0	
April				12	14,1	0,9	
May				4,8	14,1	1,0	
June							
Total	**25**			**24,8**			

1) Define the lost of grain weight during its storage due to the changes of humidity.

2) Define the lost of grain weight during its storage due to the changes of content of foreign material.

3) Define the average period of storage of grain and natural lost of weight for the total period of storage.

Variant 27

Payment of grain depend on its quality

Task 1. The company has received 150 tons of wheat grain and 150 tons pea grain with following qualities:

Indexes	Crops	
	wheat	pea
Humidity, %	16,0	17,0
Foreign material, %	2,5	7,5
Grain admixture, %	6,4	12,5
Grain-unit, g/l	730	-
Vitreous, %	76	-
Quantity of gluten, %	29	-
Quality of gluten, group	I	-
Infection by ticks, grade	I	I
Falling number, s	216	-
Mass fraction of kernel, %	-	70

Define: suitability of grain for reception, class of grain, purchase price of 1 ton of grain.

Calculate: acceptable weight of grain, value of acceptable weight, the actual cost of 1 ton of grain depending on its quality.

Natural losses of plant products during its storage

Task 2. Calculate the norm and the natural losses of 150 tons of potatoes, which were stored in the specialized storehouse from 15 September till 25 December.

Qualitative-quantitative accounting of grain during its storage

Task 3. 25 tons of barley is storing in the bags.

Results of grain movement in the economy and its quality.

Month	Incomings			Expenses			Monthly remains, t
	weight, t	humidity, %	foreign material, %	weight, t	humidity, %	foreign material, %	
July							
August	15	14,1	1,6				
September	10	14,0	1,3				
October							
November							
December							
January							
February				5	13,8	1,5	
March				12	13,7	1,3	
April				7,87	13,5	1,3	
May							
June							
Total	**25**			**24,87**			

1) Define the lost of grain weight during its storage due to the changes of humidity.

2) Define the lost of grain weight during its storage due to the changes of content of foreign material.

3) Define the average period of storage of grain and natural lost of weight for the total period of storage.

Variant 28

Payment of grain depend on its quality

Task 1. The company has received 178 tons of wheat grain and 100 tons oat grain with following qualities:

Indexes	Crops	
	wheat	oat
Humidity, %	16,0	17,0
Foreign material, %	2,5	7,5
Grain admixture, %	6,4	12,5
Grain-unit, g/l	730	-
Vitreous, %	76	-
Quantity of gluten, %	29	-
Quality of gluten, group	I	-
Infection by ticks, grade	I	I
Falling number, s	216	-
Mass fraction of kernel, %	-	70

Define: suitability of grain for reception, class of grain, purchase price of 1 ton of grain.

Calculate: acceptable weight of grain, value of acceptable weight, the actual cost of 1 ton of grain depending on its quality.

Natural losses of plant products during its storage

Task 2. Calculate the norm and natural losses of 40 tons of beets, which were stored in clamps from 10 October till 10 March.

Qualitative-quantitative accounting of grain during its storage

Task 3. 25 tons of barley is storing in the elevator.

Results of grain movement in the economy and its quality.

Month	Incomings			Expenses			Monthly remains, t
	weight, t	humidity, %	foreign material, %	weight, t	humidity, %	foreign material, %	
July							
August	15	14,0	1,3				
September	10	14,0	1,3				
October							
November							
December							
January							
February				5	13,5	1,2	
March				12	13,4	1,1	
April				7,87	13,4	1,1	
May							
June							
Total	**25**			**24,87**			

1) Define the lost of grain weight during its storage due to the changes of humidity.

2) Define the lost of grain weight during its storage due to the changes of content of foreign material.

3) Define the average period of storage of grain and natural lost of weight for the total period of storage.

Variant 29

Payment of grain depend on its quality

Task 1. The company has received 238 tons of wheat grain and 110 tons maize grain with following qualities:

Indexes	Crops	
	wheat	maize
Humidity, %	16,0	17,0
Foreign material, %	2,5	7,5
Grain admixture, %	6,4	12,5
Grain-unit, g/l	730	-
Vitreous, %	76	-
Quantity of gluten, %	29	-
Quality of gluten, group	I	-
Infection by ticks, grade	I	I
Falling number, s	216	-
Mass fraction of kernel, %	-	70

Define: suitability of grain for reception, class of grain, purchase price of 1 ton of grain.

Calculate: acceptable weight of grain, value of acceptable weight, the actual cost of 1 ton of grain depending on its quality.

Natural losses of plant products during its storage

Task 2. Calculate the norm and natural losses of 5 tons of garlic, which was stored in a stationary storehouse without artificial cooling from 15 September till 10 January.

Qualitative-quantitative accounting of grain during its storage

Task 3. 35 tons of barley is storing in the elevator.

Results of grain movement in the economy and its quality.

Month	Incomings			Expenses			Monthly remains, t
	weight, t	humidity, %	foreign material, %	weight, t	humidity, %	foreign material, %	
July							
August	15	14,0	1,3				
September	10	14,0	1,3				
October	10	14,0	1,3				
November							
December							
January							
February				5	13,5	1,2	
March				12	13,4	1,1	
April				7,87	13,4	1,1	
May				10	13,4	1,1	
June							
Total	**35**			**34,87**			

1) Define the lost of grain weight during its storage due to the changes of humidity.

2) Define the lost of grain weight during its storage due to the changes of content of foreign material.

3) Define the average period of storage of grain and natural lost of weight for the total period of storage.

Variant 30

Payment of grain depend on its quality

Task 1. The company has received 480 tons of wheat grain and 750 tons buckwheat grain with following qualities:

Indexes	Crops	
	wheat	buckwheat
Humidity, %	16,0	17,0
Foreign material, %	2,5	7,5
Grain admixture, %	6,4	12,5
Grain-unit, g/l	730	-
Vitreous, %	76	-
Quantity of gluten, %	29	-
Quality of gluten, group	I	-
Infection by ticks, grade	I	I
Falling number, s	216	-
Mass fraction of kernel, %	-	70

Define: suitability of grain for reception, class of grain, purchase price of 1 ton of grain.

Calculate: acceptable weight of grain, value of acceptable weight, the actual cost of 1 ton of grain depending on its quality.

Natural losses of plant products during its storage

Task 2. Calculate the norm and natural losses of 200 tons of potatoes, which were stored in the specialized storehouse from 10 October till 20 March.

Qualitative-quantitative accounting of grain during its storage

Task 3. 350 tons of oat is storing in the elevator.

Results of grain movement in the economy and its quality.

Month	Incomings			Expenses			Monthly remains, t
	weight, t	humidity, %	foreign material, %	weight, t	humidity, %	foreign material, %	
July							
August	210	14,6	1,7				
September	130	14,9	1,4				
October	10	14,6	1,7				
November				175	14,5	1,7	
December				135	13,8	1,1	
January				27	14,2	1,2	
February				10	14,1	1,0	
March							
April							
May							
June							
Total	**350**			**347**			

1) Define the lost of grain weight during its storage due to the changes of humidity.

2) Define the lost of grain weight during its storage due to the changes of content of foreign material.

3) Define the average period of storage of grain and natural lost of weight for the total period of storage.

3.2 Methodological advice on the individual (calculated) tasks and acquiring of practical skills of realization of technological processes of processing plant products.

3.2.1 Payment for grain on grain-collection enterprise.

Acceptance of grain, oilseeds and herbs at grain-collection enterprise begins with the organoleptic evaluation of the consignment that has come. If obvious differences in grain quality requirements of the standard were not detected, then laboratory assistant would begin sampling. After the formation of the final sampling test check organoleptic evaluation, then determine infestation by barn pests, determine the grain humidity for the location and selection of samples from a combined sample for preparation of average daily sample of homogeneous consignment. According to this sample at the end of the day we define all the other indicators of grain quality, including humidity by the main method. Results from analysis of average daily samples are recorded in the laboratory magazine and then transfer to the register of consignment and receipt checks. Average daily sample is stored during the day. If the deliver does not agree with the assessment of quality of the grain provided at the certain elevator point, during the overnight sample will be sent to a arbitration laboratory or provide re-analysis with the presence of the inspector of this laboratory. Quality of grass seeds specifies the control - seed laboratory.

With the carriage of grain, cereals, barley malt, soft and durum wheat, seeds of every culture, the economy in advance present acts of field testing of crops from which these products got and at the day of delivery, except for inventory consignment notes, wrote out one of the following documents: certificate of certified seed – for the seed of first and subsequent reproductions, which does not meet standard of cleanliness and humidity; certificate for seed, if it meets the standard, certificate of elite seeds and super elite of all crops and self-pollination lines of maize seeds. Allowance by class is paid for the seed of first and second categories of grade purity.

For strong seed and durum wheat, malt barley and other varieties of crops the higher prices are used.

When the receipts of heterogeneous grain quality are determined to do the analysis for one sample is not allowed. The number of average daily samples selected as long as the quality of consignment came, though one culture, one owner even a botanical variety.

At the basis of the price of a particular grain products are the basic rules of quality as standard according to the respective seed culture. On these norms the calculations for sold grain and seeds by farms in the light variations are provided.

The grain of strong and durum wheat is accepted by class documents. List of strong classes of wheat, malt barley and classes of other crops annually reviewed and approved by the competent authorities of the agricultural complex.

Increased prices for grain used for the grain of food destination, which conforms by the quality to the grain of child or dietary nutrition.

On the presence of strong and durum wheat crops, as well as varieties of crops and high-oil sunflower classes the procurement item reported in early summer. Agronomists of procurement points inspect such harvesting crops, look to the documents directly on the farm.

Method of grain payment.

1. Define a class of grain (Appendix 1) with actual indicators of quality (excepting indicators of humidity and foreign material) and price per 1 ton depending on class.

Class according to standard	1	2	3	4	5	6
Price for 1ton, HRV	1200	1100	900	800	700	600

2. Define an acceptable weight (per each 1 % of the excess in moisture or foreign material the discount is 1 %), to wit physical weight is reduced to the amount of discounts.

3. Determine the value of acceptable weight (by multiplying acceptable weight on the price per 1 ton).

4. Calculated of drying and cleaning payments of grain:

payment for drying = (physical weight) x (percentage of excess of humidity) = t% x (pay in HRV for every t% decrease of humidity depending on culture);

payment for cleaning = (physical weight) x (percentage of excess of foreign material) = t% x (pay in HRV for every t% decrease of foreign material depending on culture).

For each t % of excess of humidity, payment is 10 HRV.

For each t% of excess of foreign material, payment is 5 HRV.

5. Price discounts and extra charge are determined:

- For every 10 g of grain-unit of grain over basic norms according to class allowance is 0.1 % of extra charge and 10 g for every grain-unit of grain less basic applies the discount is 0.1 %;

- If the grain-unit of wheat grain 650-600 g /l the discount is 15 %, if grain-unit of wheat grain less than 600 grams per liter then discount is 30 % (in case of such low value of grain-unit the payments don't take place for the previous paragraph);

- For each 1 % of the excess of grain admixture apply discount 0.1 %;

- For the infestation by ticks of I and II degree apply discount 0.5 %.

All discounts and extra charge are calculated from the value of a acceptable weight.

6. Actual cost of 1 t = ((cost of acceptable weight ± (all price discounts and extra charge) - (payment for drying) – (payment for cleaning)) / (physical weight).

Example.

400 tons of soft wheat grain with following qualities was received to the elevator.

Humidity, %	15,0
Foreign material, %	1,5
Grain admixture, %	7,5
Grain-unit, g /l	780
Vitreous, %	70
Quantity of gluten, %	31
The quality of gluten, group	1
Infestation by ticks, degree	1
The number of falling, sec	220

Define: the class of grain, purchase price of 1 ton of grain.

Calculate: acceptable weight cost of an acceptable weight of grain, the actual cost of 1 ton of grain depending on its quality.

1. According to the standard ДСТУ-П-3768:2009. Wheat. Technical conditions (Appendix 1) by the quality indicators (excluding indicators of humidity and foreign material) grain applied to the II class and price per 1 ton due to the table is 1100 HRV.

2. Calculate acceptable weight:

Indicators	Actual	According to the standard for II class	Difference
Humidity	16,0	14,0	- 2,0
Foreign material	2,5	2,0	- 0,5
			- 2,5

Thus, to calculate the acceptable weight we must reduce the physical weight on 2,5 %.

400 - (400 x 2.5/100) = 390 t

3. The cost of acceptable weight will be:

390 x1100 = 429 000 HRV

4. According to the fact that humidity is more than the applicable standard to the class, we must make the payment for drying.

Payment for drying will be:

400 x 2% = 800 t% x 10 HRV = 8000 HRV

5. According to the fact that foreign material is more than the applicable standard to the class, we must make the payment for cleaning.

Payment for cleaning will be:

400 x 0.5% = 200 t% x 5 HRV = 1000 HRV

6. We have price extra charge for the grain-unit of grain in the amount of 0.4 %, as the actual value of grain-unit of grain (780 g /l) is more than the grain-unit (740 g /l) for this class on 40 grams per liter.

The discount for infestation by ticks is 0.5 %.

Thus, 0.4 - 0.5 = 0.1 % is discount respectively in monetary dimension, as well as all cash discounts and extra charge are calculated from the value of an acceptable weight: (429 000 x 0.1) / 100 = 429 HRV

6. The actual price for 1 t = (429 000–8000–1000–429)/400 = 1048.93 HRV

3.2.2 Quantitative-qualitative accounting of grain in storage

Arrangement of documents during the acceptance of grain is provided by its quantity in his physical weight with appropriate to one kilogram and quality of the owner. A particular attention should be noted to the accurate determination of humidity content and foreign material at all stages from acceptance of grain to its release, grain products and waste. The manager of enterprise provides a systematic review of weight enterprises by management authorities. Manufacturing Technology

Laboratory (MTL) determines the quality of grain according to the established regulations.

In case of detection of facts of differences in index weight more than 0.1% in the weighing of grain the act is issued with the person responsible for delivering cargo. When the owner of grain or financially responsible person of grain warehouse disagree with data of quality analysis conducted by MTL:

-In their presence the re-analysis should be made;

-When you disagree with the data of re-analysis of such grains the sample of grain in day is sent for analysis to laboratories established by State Control of Agricultural Production or transmitted for analysis to the authorized employee of State Control of Agricultural Production if it is in the factory;

-The results of analysis was performed by State Control of Agricultural Production is final (Technical regulations of grain composition, Adopted by the Ministry of Agrarian Policy of Ukraine on 15.06.2004, №228).

The owner of grain may deliver grain to the grain warehouse homogeneous and heterogeneous by quality consignments of grain.

Grain of homogeneous consignment is formed in the owner and at the grain warehouse is placed on types, subtypes, as indicators of quality that characterize the technological properties of grain under existing regulations, as well as by indicators of humidity content and foreign material.

Grain heterogeneous consignment - that have different technological properties or accepted with special features: sprouted grains (more than 5 %), frost-shattered, damaged by corn bug, smut grain, fuzarious grain with unusual smell, the presence of difficult separated impurities, pesticides above the permissible limits, etc.

Analysis of aggregate indicators that characterize quality of grain, show the impact of humidity and foreign material content to the mass balance. Other indicators - biological and botanical (type, subtype), chemical (protein, starch, fat, etc.), technological (size and shape of grains or seeds, vitreous, and fulfilled grain, straightness of grain, nature of grain, quantity and quality of gluten, falling number, contents of kernel of cereal crops and other), organoleptic (taste, smell, color) to

change of the balance mass with refining and storage of grain are not affected. This allows us to apply for both homogeneous and heterogeneous consignment law of conservation of weight balance.

Notes in the book of form number 36 (Book of quantitative and qualitative accounting of bakeries) are conducted daily but no later than the day following to the operational period. To this form we write a weight of grain and its quality indicators (humidity content and foreign material). In the graphs 9 and 13 of form number 36 are indicated in ton- percentage humidity, and in graphs 10 and 14 - ton- percentage by foreign material (weight multiplied by % of humidity and foreign material).

Ton-percentage is written in whole units, the share of less than 0.5 - are discarded, and 0.5 and more - are taken per unit. Indicators of humidity and foreign material are written in the books of form number 36 with exactitude to 0.1 %.

Average quality by humidity and foreign material for a period of time are determined by dividing the amount of ton-percentage to the weight of grain or products listed in the column 8 or 12 of form number 36 for the same period.

Average quality is determined with exactitude to 0.01 %.

Physiological characteristics of grain - breathing, post-harvesting ripening have little impact on the carrying balance weight and easy to calculate by the natural losses during the grain realize to owner. For the calculation of natural losses, at first we determine the average time of storage of grain by dividing of amount monthly remains of grain to the receipt of grain. Further, knowing the average time and way to storage of grain (bulk, in containers, etc.) define the norms of natural losses by a table and insert them in the appropriate formula to determine the natural loss during storage period.

At an average period of before 3 months storage standards expected losses are calculated by the formula:

$$X = \frac{a \times b}{90},$$

where X – rate of losses, %;
a – rate of lost up to 3 months inclusive, (according to table – Appendix 2), %;
b – average quantity days of storage, days;
90 – the whole period of storage, days.

If an average term of grain storage consignment products over 3 months rate of losses are calculated by the formula:

$$X = M + \frac{L \times K}{N}$$

where X - rate of losses, %;

M - rate of losses for the previous period of storage, according to table (Appendix 2), %;

L - difference between the highest and lowest norms of losses for the intermediate term storage, %;

K – the difference between the average time of storage the consignment and time of storage determination for previous norms, months;

N - quantity of months of storage that apply to difference between the losses norms.

During the transporting bread products by rail or water transport natural losses of grain should not exceeded to the control limit rules: at the distance of transportation up to 1000 km - 0,1%; from 1000 till 2000 km - 0.15 %; over 2000 km – 0.2 % and during transportation by car transport control limit rules are: bulk cargo - 0.09 %, freight container - 0.07%.

Example.

500 ton of grain was received to the elevator. 494.5 ton was realized and the lost weight was 5.5 ton. Grain was received with 15.0 and 16.0 % of the humidity, 0.5 and 1.0 % of foreign material; the grain was realized with humidity of 14.0, 14.1, 15.0 % and foreign material of 0.5, 0.7 and 1.0 %. Grain was stored in bulk. Determine losses of weight by changing humidity, foreign material and natural losses for the total period of storage.

Month	Incomings			Expenses			Monthly remains, t
	weight, t	humi-dity, %	foreign material, %	weight, t	humi-dity, %	foreign material, %	
August	100.5	15.0	1.0	–	–	–	100.5
September	200.35	16.0	0.5	–	–	–	300.85
October	–	–	–	–	–	–	300.85
November	199.15	15.0	1.0	–	–	–	500
December	–	–	–	–	–	–	500
January	–	–	–	105	14.0	1.0	395
February	–	–	–	4.5	15.0	1.0	390.5
March	–	–	–	–	–	–	390.5
April	–	–	–	–	–	–	390.5
May	–	–	–	–	–	–	390.5
June	–	–	–	300	15.0	0.5	90.5
July	–	–	–	–	–	–	90.5
August	–	–	–	85	14.1	0.7	-
Total:	**500**			**494.5**			**3840.2**

I. Determination of average humidity of grain which Incomings:

Incomings, t		**Humidity, %**	
100.5	x	15,0	= 1507.5 t%
200.35	x	16,0	= 3205.6 t%
199.15	x	15,0	= 2987.25 t%
500.00 t			7700.35 t%

$\frac{7700,35t\%}{500t} = 15,40\%$ (a) – average humidity by receipt.

Determination of average humidity of grain which Expenses:

Expenses, t		**Humidity, %**	
105	x	14,0	= 1470 t%
300	x	15,0	= 4500 t%
4,5	x	15,0	= 67,5 t%
85	x	14,1	= 1198,5 t%
494,5 t			7236 t%

$\frac{7236\ t\%}{494\ ,5t} = 14\,,63 \quad \%\,(b)$ – average humidity by losses.

II. Determination of average foreign material of grain which Incomings:

Incomings, t		**Foreign material, %**	
100,5	x	1,0	= 100,5 t%
200,35	x	0,5	= 100,175 t%
199,15	x	1,0	= 199,15 t%
500 t			399,825 t%

$\frac{399,825t\%}{500t} = 0,79 \quad \%(c)$ – average content of foreign material by receipt.

Determination of average foreign material of grain which Expenses:

Expenses, t		**Foreign material, %**	
105	x	1,0	= 105 t%
4,5	x	1,0	= 4,5 t%
300	x	0,5	= 59,5 t%
85	x	0,7	= 59,5 t%
494,5 t	x		319 t%

$\frac{319\ t\%}{494\ ,5t} = 0,65 \quad \%\,(d)$ – average of foreign material by losses.

V. Loss of weight due to humidity changes:

$X = \frac{100 \times (a-b)}{(100-b)} = \frac{100(15,40-14,63)}{100-14,63} = 0,90\ \%$ (e)

$\frac{500 \times 0,90}{100} = 4,5$ t– can be write off by the changes of humidity.

VI. Loss of weight due to foreign material changes:

$X = \frac{(c-d) \times (100-e)}{(100-d)} = \frac{(0,79-0,65) \times (100-0,90)}{(100-0,65)} = 0,15\ \%$

$\frac{500 \times 0,15}{100}$ =0,75 t – can be write off by the changes of foreign material.

Total weight, which we can be write off by the changes of humidity and foreign material:

4,5 + 0,75 = 5,25

VII. Calculate the average term of grain storage:

$$\frac{amount \quad remains \quad on \quad 1 \quad date \quad next \quad month}{amount \quad receipt} = \frac{3840,2}{500} = 7,7 \text{ months}$$

VIII. Calculation of natural losses of grain during the total storage:

Norms of natural expenses x (%) is determined by the formula:

$$X = M + \frac{L \times K}{N},$$

where X - rate of losses, %;

M - rate of losses for the previous period of storage, according to table (Appendix 2), %;

L - difference between the highest and lowest norms of losses for the intermediate term storage, %;

K – the difference between the average time of storage the consignment and time of storage determination for previous norms, months;

N - quantity of months of storage that apply to difference between the losses norms.

$$x = 0,09 + \frac{(0,12 - 0,09) \times (7,7 - 6)}{12 - 6} = 0,09 + \frac{0,02 + 1,7}{6} = 0,095 \quad \%$$

$\frac{500 \times 0,095}{100} = 0,48$ t - can be writing off additionally by the natural losses.

3.2.3 Calculation of losses of vegetables and potato tubers during long-term storage

The most important end result of storage is a quality products and its loss during storage.

Losses during storage of vegetables and potatoes consist of the natural weight loss, physical (losses of wilt) and losses due to change in the quality of fruits.

Natural weight loss is caused by wasting of spare nutrients and water to fruit respiration. Natural weight loss fruit apples and pears range from 0.1 to 1 %. Losses increase due to the distance in time between start of storage and harvesting period of fruit.

For example, start of storage after 5 days harvesting period increased natural weight losses on 1.5 %, after 20 days – 2 %. Natural losses all fruits and vegetables at very early term of harvesting exceeded norms of standards.

Norms of natural loss of fresh vegetables and fruits are determined to the insert on storage of healthy and quality products (Appendix 3).

During the storage there are changes of vegetables and potatoes as a result appearing fractions – technical and absolute discard.

If weight of consignment in the process storage did not change according to actual weight loss products and norms by month, crops and place of storage calculate weight of products, which due to discard for result natural losses.

Example.

Congsigment of potato tubers with weight 1000 tons is stored in clamps from 1 October to 20 April; zone cold. Natural losses during the whole storage period will be (Appendix 3):

In October – 1000 x 1,0 / 100 = 10 tons, 990 tons is remainder

In November – 990 x 0,7 / 100 = 6.93 tons, 983.07 tons is remainder

In December – 983,07 x 0,4 / 100 = 3.93 tons, 979.14 tons is remainder

In January – 979,14 x 0,4 / 100 = 3.92 tons, 975.22 tons is remainder

In February – 975,22 x 0,4 / 100 = 3.9 tons, 971.32 tons is remainder

In March – 971,32 x 0,7 / 100 = 6.97 tons, 964.52 tons is remainder

In April – 964,52 x 0,6 / 100 = 5.79 tons, 958.73 tons is remainder

The latest of losses rate for April month counts as follows. The lost for the full month is 0.9%. April have 30 days. Dividing the rate of of losses this month on the number of days in the month we get value of losses in one day (0.9 / 30 = 0.03%). Then this norm multiplies on the quantity days of storage in this month (20 days.) Obtain the required norm:

0,03 x 20 = 0.6%

Thus, total losses are 1000-958,73 = 41.27 tons.

If the storage product was sold on the needs, natural losses determine based on average balances for each month of storage. Average balance determined as of 1st, 11th and 21st of the current month and 1st of next month. And on the 1st of the current month and next month take half, add it to remains on the 11th and 21st number, and divide the sum by 3. Such calculations are carried out each month.

On applying the weight balance rate of natural loss in a given month and counting the number of products subject to charges.

Example.

In September, granular fruit started to flow to the storehouse. On September 1 they have not been on the 11th - 60 tons, to 21st - 340 tons on October 1 - 700 tons. The average balance for September will be:

((0 + 60 + 340) + (700 / 2)) / 3 = 250.

At the rate of natural loss for September 1% weight loss can amount to 2.5 tons (250 / 1 / 100).

The weight of the loss X for control samples determines the ratio of weight difference of samples before storage (M_1) and after storage (M_2):

$$X = \frac{M_1 - M_2}{M_1}$$

Calculated rate of actual losses can include not only the natural loss of breath, but also losses from wilt, especially when significant violations of temperature and humidity conditions for storage.

The actual rate of natural loss of a certain consignment may increase due to the fruit in keeping with the significant deviate from the standard quality. In this case, consider the actual loss and reasonable charges. If a consignment change in the quality of fruits or vegetables because of violations of the storage, leading to significant losses, create a commission of competent persons for a thorough analysis of storage with all possible factors influencing the safety of products. From various places of acceptable for a given production method selects samples to evaluate quality and implement the commodity assessment psychopathology and revealing causes damage.

Joint test is divided into three factions: 1) standard fruit, 2) technical discard (fruits with small injuries that can be used for processing), 3) the absolute discard (half-rotted fruit and more). According psychopathological analysis and evaluation create the act, determine causes damage to fruit.

With proper storage of standard products losses are small.

4. Additional tasks.

To acquaintance with requirements to the wheat grain according of USA and Canadian standards (Appendixe 5-6). Compare requirements of the USA and Canadian standards to the wheat with requirements in the Ukrainian standard.

5. Requirements for design report about undergoing practical training

Each student makes the practical report individually. Content of report is made conditional on the program and reflects everything that a student has learned, investigated for the period practice and performed individual tasks.

The report is issued by the requirements that the educational institution establishes, adjusted a single standard of scientific design documents.

The amount of work can be approximately 10-20 pages of handwriting. However, the author's desire to increase to more complete and detailed presentation of specific issues is not limited.

The main editorial requirements

Pages should have margin (regardless of handwritten or printed text), mm: left - 30, right - 10, top - 20 and bottom - 20.

It is impossible to use common abbreviations such as EW (estimated work) etc., except tables.

If there is not dimension it is necessary to write numbers up to ten in words (g, cm, ml, etc.), more than ten in numbers, and fractions in numbers only.

Numbers with dimension is written down in numbers (10 $м^2$, 20 ^{0}C, 1-2 kg per 100 g dry matter, etc.).

It should be follow the abridgements comply of physical units or other units (mg, g, kg, mm, cm, m, km, minutes, hours, etc.).

All pages (including figures, photographs) is numbered in order starting with the third (number is not put on the first and second pages). It is necessary to apply the number to the upper right top margin. Main page is arranged for established sample. Each part of a report is illustrated the relevant tables, graphs, according to program information. Practice manager checks the report and makes a decision being given a

clearance to the defense of practice. It is evaluated undergoing practice for credit-modular system based on the report, its quality, completeness and individual program objectives and the defense of its by students. Practice manager marks grades for practice in exam-register and student's record book. When you practice on an individual schedule, a basis for test is a report to teacher about performance the program tasks.

Example of cover page of the report is listed in appendix 4.

APPENDIXES

Appendix 1

Requirements to quality of wheat concordantly ДСТУ-П-3768:2009 Wheat. Technical requirements

Table 1 – The quality indexes of the soft wheat grain

Indexes	The description and norm by groups and classes for soft wheat					
	A			B		
	1	2	3	4	5	6
Grain-unit, g/l, no less than	760	740	730	710	710	Unlimited
Vitreous, %, no less than	50	40	30	Unlimited		
Humidity, %, no more than	14,0	14,0	14,0	14,0	14,0	14,0
Grain admixture, %, no more than	5,0	8,0	8,0	10,0	12,0	15,0
Especially:						
the grain of cereals	4,0	4,0	4,0	4,0	4,0	Within the grain admixture
sprout grain	2,0	3,0	4,0	4,0	4,0	Within the grain admixture
Foreign impurity, %, no more than	1,0	2,0	2,0	2,0	2,0	5,0
Especially:						
mineral admixture	0,3	0,5	0,5	0,5	0,5	1,0
Especially:						
pebble, slag, ore	0,15	0,15	0,2	0,15	0,2	Within the mineral admixture
spoiled grain	0,3	0,3	0,5	0,3	0,5	1,0
Especially:						
fuzarious grain	Within the spoiled grains					
harmful admixture	0,2	0,2	0,2	0,2	0,2	0,5
Especially:						
smut, ergot	0,05	0,05	0,05	0,05	0,05	0,1
Trichodesma incanum	Exclude					
cockle	Within the harmful admixture					
every of the sorts of other toxic grain	0,05	0,05	0,05	0,05	0,05	0,1
Smutty grain , %, no more than	5,0	5,0	8,0	5,0	8,0	10,0
Mass part of protein in re-calculation on dry substance, %, no less than	14,0	12,5	11,0	12,5	11,0	Unlimited
Mass part of row gluten, %, no less than	28,0	23,0	18,0	Unlimited		
Quality of gluten:						
group	I-II	I-II	I-II	Unlimited		
units of device VDK	45-100	45-100	45-100			
The number of falling, sec, no less then	220	180	150	150	130	Unlimited

Table 2 - The quality indexes of the hard wheat grain

Indexes	The description and norm by classes for hard wheat				
	1	**2**	**3**	**4**	**5**
The grain of soft wheat, %, no less than	4	4	8	10	Unlimited
Grain - unit, g/l, no less than	750	750	730	710	Unlimited
Humidity, %, no more than	14,5	14,5	14,5	14,5	14,5
Vitreous, %, no less than	70	60	50	40	Unlimited
Grain admixture, %, no more than	5,0	5,0	8,0	10,0	15,0
Especially:					
sprout grain	1,0	1,0	3,0	3,0	Within the grain admixture
Foreign material, %, no more than	2,0	2,0	2,0	5,0	5,0
Especially:					
mineral admixture	0,3	0,3	0,5	0,5	1,0
Especially:					Within the mineral admixture
pebble, slag, ore	0,15	0,15	0,2	0,3	
spoiled grain	0,2	0,2	0,5	1,0	1,0
Especially:					
fuzarious grain	Within the spoiled grains				
harmful admixture	0,2	0,3	0,5	0,5	0,5
Especially:					
smut, ergot	0,05	0,05	0,1	0,1	0,1
Trichodesma incanum	Disallow				
cockle	Within the harmful admixture				
every of the sorts of other toxic grain	0,05	0,05	0,05	0,05	0,1
Smut grain, %, no more than	5,0	5,0	5,0	5,0	10,0
Mass part of protein in re-calculation on dry substance , %, no less than	15,0	14,0	12,0	11,0	Unlimited
The number of falling, sec, no less than	200	200	150	100	Unlimited

Appendix 2

Restrictive-control norms of natural losses at storage grain,%

Grain (seed) and its processed products	Term storage	In warehouses		In elevators	On adapted to storage sites
		bulk	in bags		
Wheat, rye, barley, spelt	Up to 3 months.	0,07	0,04	0,05	0,12
	Up to 6 months.	0,09	0,06	0,07	0,16
	Up to 1 year	0,12	0,09	0,10	-
Oats	Up to 3 months	0,09	0,05	0,06	0,15
	Up to 6 months	0,13	0,07	0,08	0,20
	Up to 1 year	0,17	0,09	0,12	-
Buckwheat, rice	Up to 3 months	0,08	0,05	0,06	-
	Up to 6 months.	0,11	0,07	0,08	-
	Up to 1 year	0,15	0,10	0,12	-
Millet, Foxtail millet, sorghum	Up to 3 months	0,11	0,06	0,07	0,14
	Up to 6 months.	0,15	0,08	0,09	0,19
	Up to 1 year	0,19	0,10	0,14	-
Corn	Up to 3 months	0,13	0,07	0,08	0,18
	Up to 6 months.	0,17	0,10	0,12	0,22
	Up to 1 year	0,21	0,13	0,16	-
Cornbob	Up to 3 months	0,25	-	-	0,45
	Up to 6 months.	0,30	-	-	0,55
	Up to 1 year	0,45	-	-	0,70
Peas, lentils, bean, haricot bean, vetch, soybean	Up to 3 months	0,07	0,04	0,05	-
	Up to 6 months.	0,09	0,06	0,07	-
	Up to 1 year	0,12	0,08	0,10	-
Sunflower	Up to 3 months	0,20	0,12	0,14	0,24
	Up to 6 months.	0,25	0,15	0,18	0,30
	Up to 1 year	0,30	0,20	0,23	-
Other oilseeds	Up to 3 months.	0,10	0,08	-	-
	Up to 6 months.	0,13	0,11	-	-
	Up to 1 year	0,17	0,14	-	-
Cereals, including rice	Up to 3 months.	-	0,04	-	-
	Up to 6 months.	-	0,06	-	-
	Up to 1 year	-	0,09	-	-
Flour	Up to 3 months	-	0,05	-	-
	Up to 6 months.	-	0,07	-	-
	Up to 1 year	-	0,10	-	-
Bran and flour	Up to 3 months	0,20	0,12	-	-
	Up to 6 months.	0,25	0,16	-	-
	Up to 1 year	0,35	0,20	-	-

Appendix 3

Norms of natural losses of mass of fruit and vegetable products and potato at the prolonged storage, %

Production	Type depository for storage of fruits	September	October	November	December	January	February	March	April	May	June	July	August
Cold Zone *													
Apples:													
autumn	Coolers	1,2	0,8	0,6	0,5	0,5	0,4	-	-	-	-	-	-
	Without the artificial cooling	2,0	1,2	1,2	1,0	1,0	-	-	-	-	-	-	-
winter	Coolers	1,0	0,4	0,3	0,3	0,25	0,25	0,3	0,3	0,3	0,5	-	-
	Without the artificial cooling	1,8	0,8	0,6	0,5	0,5	0,5	-	-	-	-	-	-
Pears	Coolers	1,0	0,8	0,6	0,6	0,5	0,4	0,4	0,4	0,5	-	-	-
	Without the artificial cooling	2,0	1,5	1,4	0,7	0,6	0,6	-	-	-	-	-	-
Grapes	Coolers	1,0	0,8	0,8	0,6	0,4	0,4	0,4	-	-	-	-	-
Cranberry	Warehouses and canopy	-	-	0,8	0,8	0,7	0,7	0,7	1,5	2,0	4,0	5,0	-
Cowberry	Warehouses and canopy	5,0	-	-	-	-	-	-	-	-	-	-	3,0
Warm Zone *													
Apples:													
autumn	Coolers	1,2	0,8	0,6	0,5	0,5	0,4	-	-	-	-	-	-
winter	«	1,0	0,4	0,3	0,3	0,25	0,25	0,3	0,3	0,5	0,5	-	-
Pears	«	1,0	0,8	0,6	0,6	0,5	0,4	0,4	0,4	0,4	-	-	-
Grapes	Warehouses without artificial cooling	1,5	1,2	1,2	0,9	0,8	0,8	-	-	-	-	-	-
	Coolers	1,0	0,8	0,8	0,6	0,4	0,4	0,4	-	-	-	-	-
Cranberry	Warehouses without artificial cooling	-	-	1,0	1,0	1,0	1,0	1,0	1,7	-	-	-	-

* The warm zone includes Crimea, Mykolaiv, Kherson, Odessa region, the cold - other regions of Ukraine.

Production	Type of depository	September	October	November	December	January	February	March	April	May	June	July	August
Cold Zone *													
Beets, radish, rutabaga, kohlrabi, parsnip	With the artificial cooling	1,5	0,8	0,8	0,7	0,6	0,6	0,6	0,8	0,9	0,9	-	-
	Without the artificial cooling	1,7	0,9	0,8	0,7	0,6	0,6	0,6	0,8	1,1	1,9	-	-
	Clamps, trenches	1,5	1,0	0,7	0,6	0,2	0,3	0,6	0,9	2,0	-	-	-
Carrot, parsley, celery, turnip	With the artificial cooling	2,2	1,3	1,2	0,8	0,7	0,7	0,7	1,0	1,0	1,0	-	-
	Without the artificial cooling	2,3	2,0	1,3	0,8	0,7	0,8	1,0	1,2	1,4	-	-	-
	Clamps, trench with the mixing of sand	1,2	1,0	0,6	0,4	0,3	0,4	0,4	0,6	1,2	-	-	-
	Clamps, Trenches**	1,5	1,3	1,2	0,6	0,6	0,6	0,8	0,9	2,0	-	-	-
White cabbage, Red, Savoy, russels grades:													
Average maturity	Without the artificial cooling	-	3,3	2,4	1,1	2,5	2,7	-	-	-	-	-	-
	Clamps, trenches	-	3,3	1,8	1,0	2,0	2,5	-	-	-	-	-	-
Late maturity	With the artificial cooling	-	2,3	1,3	1,0	1,0	1,0	1,0	1,3	1,8	1,8	-	-
	Without the artificial cooling	-	2,8	2,1	1,0	1,0	1,2	1,3	1,5	-	-	-	-
	Clamps, trenches	-	2,8	1,8	0,8	0,8	0,8	1,1	1,3	-	-	-	-
Onion-Ripky and sample food	With the artificial cooling	0,8	0,7	0,6	0,5	0,5	0,5	0,6	0,8	1,1	1,2	1,5	1,5
	Without the artificial cooling	1,7	1,2	1,1	0,6	0,6	0,6	0,6	1,0	1,7	-	-	2,5
Garlic	With the artificial cooling	1,6	1,0	0,9	0,9	0,9	0,9	0,9	0,9	1,5	1,5	1,5	1,7
Pumpkins	Without the artificial cooling	3,0	2,0	1,2	1,1	1,1	1,2	1,3	1,5	-	-	-	-
	With the artificial cooling	1,5	1,2	0,7	0,5	0,3	-	-	-	-	-	-	-
Potato	Specialized store	1,4	1,2	0,8	0,6	0,5	0,5	0,5	0,9	1,1	-	-	-
	Clamps, trenches	1,4	1,0	0,7	0,4	0,4	0,4	0,7	0,9	1,5	-	-	-

Warm Zone													
Beets, radish, rutabaga, kohlrabi, parsnip	With the artificial cooling	1,6	1,1	1,0	0,7	0,6	0,7	1,1	1,1	1,1	1,2	-	-
	Without the artificial cooling	2,0	1,3	1,0	0,7	0,6	0,7	1,2	1,8	1,9	2,0	-	-
	Clamps, trenches	-	1,5	1,3	0,7	0,5	0,6	0,7	2,3	2,5	-	-	-
Carrots, parsley, celery, turnip	With the artificial cooling	2,3	1,8	1,3	0,8	0,7	1,3	1,4	1,6	1,8	1,9	-	-
	Without the artificial cooling	2,5	2,2	1,3	0,8	0,7	1,3	1,6	2,3	2,5	-	-	-
White cabbage, Red, Savoy, Brussels grades:													
Average maturity	Without the artificial cooling	-	4,0	3,8	2,3	-	-	-	-	-	-	-	-
	Clamps, trenches	-	3,5	2,3	1,8	1,3	1,3	2,0	-	-	-	-	-
Late maturity	Without the artificial cooling	-	3,8	3,5	2,0	1,4	1,4	2,1	-	-	-	-	-
	Clamps, trenches	-	3,8	-	-	-	-	-	-	-	-	-	-
Onion-Ripky and sample food	With the artificial cooling	0,8	0,7	0,6	0,5	0,5	0,5	1,0	1,3	1,6	1,6	1,8	1,8
	Without the artificial cooling	2,0	1,5	1,3	0,7	0,6	0,7	1,1	1,6	2,0	-	-	3,0
Garlic	With the artificial cooling	1,9	1,7	1,2	1,0	1,0	1,0	1,0	1,0	1,7	1,7	1,7	2,0
	Without the artificial cooling	3,2	2,1	1,5	1,1	1,1	1,2	2,0	2,5	-	-	-	-
Pumpkins	With the artificial cooling	1,5	1,2	0,7	0,5	0,3	0,3	-	-	-	-	-	-

∗In the cool zone when stored in storage products without artificial cooling loss set at specific norms established for depositories with artificial cooling.

** When storing root crops in the trench and tabular heaps of mixed sand specific losses do not determine, with cold storage with controlled environment such losses calculated by the rules for storage of cooled minus 15 %.

Appendix 4

Example of cover page report

NATIONAL UNIVERSITY OF LIFE AND ENVIRONMENTAL SCIENCES OF UKRAINE

Depertment of storage, processing and plant product standardization named after prof. B.V. Lesik

REPORT
of the practical training on the discipline
"Technology systems of production and processing of crop production:
“Technology processing and storage of agricultural products”

Finished of student of Agrarian management (rate group)
Name

Head of practice
Name

Kyiv 20_

Wheat. Grades and Grade Requirements according of USA standard

	Grades U.S. Nos.[1]				
Grading Factors	1	2	3	4	5
Minimum pound limits of:					
Test Weight					
Hard Red Spring wheat or White Club wheat (lbs/bu)	58.0	57.0	55.0	53.0	50.0
All other classes and subclasses (lbs/bu)	60.0	58.0	56.0	54.0	51.0
Maximum percent limits of:					
Defects					
Damaged kernel					
Heat (part of total)	0.2	0.2	0.5	1.0	3.0
Total	2.0	4.0	7.0	10.0	15.0
Foreign material	0.4	0.7	1.3	3.0	5.0
Shrunken and broken kernels	3.0	5.0	8.0	12.0	20.0
Total[1]	3.0	5.0	8.0	12.0	20.0
Wheat of other classes[2]					
Contrasting classes	1.0	2.0	3.0	10.0	10.0
Total[3]	3.0	5.0	10.0	10.0	10.0
Stones	0.1	0.1	0.1	0.1	0.1
Maximum count limits of:					
Other material					
Animal filth	1	1	1	1	1
Castor beans	1	1	1	1	1
Crotalaria seeds	2	2	2	2	2
Glass	0	0	0	0	0
Stone	3	3	3	3	3
Unknown foreign substance	3	3	3	3	3
Total[4]	4	4	4	4	4
Insect-damaged kernels in 100 grams	31	31	31	31	31

U.S. Sample Grade

Wheat that:

(a) Does not meet the requirements for U.S. Nos. 1, 2, 3, 4, or 5; or

(b) Has a musty, sour, or commercially objectionable foreign odor (except smut or garlic odor); or

(c) Is heating or of distinctly low quality.

[1]Includes damaged kernels (total), foreign material, and shrunken and broken kernels.

[2]Unclassed wheat of any grade may contain not more than 10.0 percent of wheat of other classes.

[3]Includes contrasting classes.

[4]Includes any combination of animal filth, castor beans, crotalaria seeds, glass, stones, or unknown foreign substance.

Export grade determinant tables

Wheat, Canada Western Red Spring (CWRS)

Column	1			Foreign Material 2	3	4	*5 (2+3+4)	6	7	*8 (2+6+7)	*9 (1+2+4+6+7)
	Broken grain through #5 buckwheat sieve										
Grade Name	Ex Primary %	Ex Terminal %	Ex Transfer %	Small seeds %	Attrition %	Roughage %	Total small seeds, attrition and roughage %	Large seeds %	Wild oats %	Total small seeds, large seeds and wild oats %	Total small seeds, large seeds, wild oats, roughage and broken grain through #5 buckwheat sieve %
No. 1 CWRS	0.3	0.35	0.5	0.05	0.10	0.05	0.1	0.2	0.05	0.2	0.5
No. 2 CWRS	0.3	0.35	0.5	0.05	0.10	0.05	0.1	0.2	0.05	0.2	0.5
No. 3 CWRS	0.3	0.35	0.5	0.05	0.10	0.05	0.1	0.2	0.05	0.2	0.5
No. 4 CWRS	0.3	0.35	0.5	0.05	0.10	0.05	0.1	0.2	0.05	0.2	0.5
CW Feed	0.5	0.5	0.5	0.05	0.10	0.1	0.1	0.5	0.1	0.5	0.5

Column	Foreign Material 10	11	12	13	14	*15 (2+3+4+6+7 +10+11+12+13+14)
Grade name	Stones %	Mineral matter including stones %	Ergot %	Sclerotinia %	Other cereal grains and other matter %	Total foreign material %
No. 1 CWRS	0.03	0.06	0.01	0.01	0.4	0.4
No. 2 CWRS	0.03	0.10	0.02	0.02	0.75	0.75
No. 3 CWRS	0.06	0.10	0.04	0.04	1.25	1.25
No. 4 CWRS	0.06	0.10	0.04	0.04	2.4	2.4
CW Feed	0.1	0.25	0.1	0.1	5	5

* Columns which represent a subtotal of other columns show the columns to be added in parenthesis
The area inside dashed lines refers to factors which are assessed in determining commercial cleaniiness.
Total foreign material does not include broken wheat passing through the #5 buckwheat sieve

Wheat, Canada Western Red Spring (CWRS) continued

Grade name	Minimum test weight kg/hl (g/0.5 L)	Wheats of other classes or varieties		Minimum hard vitreous kernels %	Sprouted		Heated		Shrunken and broken (**)		
		Contrasting classes %	Total %		Severely sprouted %	Total %	Binburnt, severely mildewed, rotted, mouldy %	Total %	Shrunken %	Broken %	Total %
No. 1 CWRS	79 (385)	0.5	1.5	65	0.10	0.5	1 kernel per 1000 g	0.05	4	5	7
No. 2 CWRS	77.5 (378)	1.5	3	No minimum	0.20	1.0	4 kernels per 1000 g	0.4	4	6	8
No. 3 CWRS	76.5 (373)	2.5	5	No minimum	0.30	3.0	6 kernels per 1000 g	1.0	4	7	9
No. 4 CWRS	75 (365)	2.5	5	No minimum	0.50	5	6 kernels per 1000 g	1.0	4	7	9
CW Feed	73 (355)	No limit–but not more than 10% amber durum and/or General Purpose		No minimum	No limit	No limit	2.5	2.5	4	13	15

(**) See truncation rule for "Shrunken and Broken"

Wheat, Canada Western Hard White Spring (CWHWS)

Column	1			Foreign Material 2	3	4	*5 (2+3+4)	6	7	*8 (2+6+7)	*9 (1+2+4+6+7)
	Broken grain through #5 buckwheat sieve										
Grade Name	Ex Primary %	Ex Terminal %	Ex Transfer %	Small seeds %	Attrition %	Roughage %	Total small seeds, attrition and roughage %	Large seeds %	Wild oats %	Total small seeds, large seeds and wild oats %	Total small seeds, large seeds, wild oats, roughage and broken grain through #5 buckwheat sieve %
No. 1 CWHWS	0.3	0.35	0.5	0.05	0.10	0.05	0.1	0.2	0.05	0.2	0.5
No. 2 CWHWS	0.3	0.35	0.5	0.05	0.10	0.05	0.1	0.2	0.05	0.2	0.5
No. 3 CWHWS	0.3	0.35	0.5	0.05	0.10	0.05	0.1	0.2	0.05	0..2	0.5
No. 4 CWHWS	0.3	0.35	0.5	0.05	0.10	0.05	0.1	0.2	0.05	0..2	0.5
CW Feed	0.5	0.5	0.5	0.05	0.10	0.1	0.1	0.5	0.1	0.5	0.5

Column	Foreign Material 10	11	12	13	14	*15 (2+3+4+6+7 +10+11+12+13+14)
Grade name	Stones %	Mineral matter including stones %	Ergot %	Sclerotinia %	Other cereal grains and other matter %	Total foreign material %
No. 1 CWHWS	0.03	0.06	0.01	0.01	0.4	0.4
No. 2 CWHWS	0.03	0.10	0.02	0.02	0.75	0.75
No. 3 CWHWS	0.06	0.10	0.04	0.04	1.25	1.25
No. 4 CWHWS	0.06	0.10	0.04	0.04	2.4	2.4
CW Feed	0.1	0.25	0.1	0.1	5	5

* Columns which represent a subtotal of other columns show the columns to be added in parenthesis
The area inside dashed lines refers to factors which are assessed in determining commercial cleanliness.
Total foreign material does not include broken wheat passing through the #5 buckwheat sieve

Wheat, Canada Western Hard White Spring (CWHWS) continued

Grade name	Minimum test weight kg/hl (g/0.5 L)	Wheats of other classes or varieties		Sprouted		Heated		Shrunken and broken (**)		
		Contrasting classes %	Total %	Severely sprouted %	Total %	Binburnt, severely mildewed, rotted, mouldy %	Total %	Shrunken %	Broken %	Total %
No. 1 CWHWS	79 (385)	0.5	1.5	0.10	0.5	1 kernel per 1000 g	0.05	4	5	7
No. 2 CWHWS	77.5 (378)	1.5	3	0.20	1.0	4 kernels per 1000 g	0.4	4	6	8
No. 3 CWHWS	76.5 (373)	2.5	5	0.30	3.0	6 kernels per 1000 g	1.0	4	7	9
No. 4 CWHWS	75 (365)	2.5	5	0.50	5	6 kernels per 1000 g	1.0	4	7	9
CW Feed	73 (355)	No limit–but not more than 10% amber durum and/or General Purpose		No limit	No limit	2.5	2.5	4	13	15

(**) See truncation rule for "Shrunken and Broken"

Wheat, Canada Western Amber Durum (CWAD)

Column	1			Foreign Material 2	3	4	*5 (2+3+4)	6	7	*8 (2+6+7)	*9 (1+2+4+6+7)
	Broken grain through #5 buckwheat sieve										
Grade Name	Ex Primary %	Ex Terminal %	Ex Transfer %	Small seeds %	Attrition %	Roughage %	Total small seeds, attrition and roughage %	Large seeds %	Wild oats %	Total small seeds, large seeds and wild oats %	Total small seeds, large seeds, wild oats, roughage, and broken grain through #5 buckwheat sieve %
No. 1 CWAD	0.3	0.35	0.5	0.05	0.10	0.05	0.1	0.2	0.15	0.2	0.5
No. 2 CWAD	0.3	0.35	0.5	0.05	0.10	0.05	0.1	0.2	0.15	0.2	0.5
No. 3 CWAD	0.3	0.35	0.5	0.05	0.10	0.05	0.1	0.2	0.15	0.2	0.5
No. 4 CWAD	0.5	0.5	0.5	0.05	0.10	0.05	0.1	0.2	0.15	0.2	0.5
No. 5 CWAD	0.5	0.5	0.5	0.05	0.10	0.1	0.1	0.5	0.15	0.5	0.5

Column	Foreign Material 10	11	12	13	14	*15 (2+3+4+6+7 +10+11+12+13+14)
Grade name	Stones %	Mineral matter including stones %	Ergot %	Sclerotinia %	Other cereal grains and other matter %	Total foreign material %
No. 1 CWAD	0.03	0.06	0.01	0.01	0.5	0.5
No. 2 CWAD	0.03	0.10	0.02	0.02	0.8	0.8
No. 3 CWAD	0.06	0.10	0.04	0.04	1.0	1.0
No. 4 CWAD	0.06	0.10	0.04	0.04	3.0	3.0
No. 5 CWAD	0.1	0.25	0.1	0.1	5	5

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The area inside dashed lines refers to factors which are assessed in determining commercial cleanliness.
Total foreign material does not include broken wheat passing through the #5 buckwheat sieve

Wheat, Canada Western Amber Durum (CWAD) continued

Grade name	Minimum test weight kg/hl (g/0.5 L)	Wheats of other classes or varieties		Minimum hard vitreous kernels %	Sprouted		Heated		Shrunken and broken (**)			Smudge and blackpoint			
												Smudge			
		Wheats of other classes %	Total %		Severely sprouted %	Total %	Binburnt, severely mildewed, rotted, mouldy %	Total %	Shrunken %	Broken %	Total %	Penetrated %	Red %	Total %	Total %
No. 1 CWAD	80 (392)	2.0	3	80	0.10	0.5	1 kernel per 1000 g	0.05	3	6	7	3K	30K	30K	5
No. 2 CWAD	79.5 (390)	2.5	5	60	0.20	2	2 kernels per 1000 g	0.1	3	8	9	0.25	1	1	10
No. 3 CWAD	78 (382)	3.5	7	40	8	8	4 kernels per 1000 g	0.4	3	10	11	0.5	1	3	20
No. 4 CWAD	75 (367)	10	15	No minimum	12	12	0.5	1.5	3	11	12	Consider overall appearance No limit			
No. 5 CWAD	73 (357)	15	No limit	No minimum	No limit	No limit	5	5	3	13	15				

K Number of kernel-sized pieces in 500 g

(**) See truncation rule for "Shrunken and Broken"

Wheat, Canada Western Red Winter (CWRW)

Column	1			Foreign Material 2	3	4	*5 (2+3+4)	6	7	*8 (2+6+7)	*9 (1+2+4+6+7)
	Broken grain through #5 buckwheat sieve										
Grade Name	Ex Primary %	Ex Terminal %	Ex Transfer %	Small seeds %	Attrition %	Roughage %	Total small seeds, attrition and roughage %	Large seeds %	Wild oats %	Total small seeds, large seeds and wild oats %	Total small seeds, large seeds, wild oats, roughage, and broken grain through #5 buckwheat sieve %
No. 1 CWRW	0.3	0.35	0.5	0.05	0.10	0.05	0.1	0.2	0.1	0.2	0.5
No. 2 CWRW	0.3	0.35	0.5	0.05	0.10	0.05	0.1	0.2	0.1	0.2	0.5
CW Feed	0.5	0.5	0.5	0.05	0.10	0.1	0.1	0.5	0.1	0.5	0.5

Column	Foreign Material 10	11	12	13	14	*15 (2+3+4+6+7 +10+11+12+13+14)
Grade name	Stones %	Mineral matter including stones %	Ergot %	Sclerotinia %	Other cereal grains and other matter %	Total foreign material %
No. 1 CWRW	0.03	0.06	0.01	0.01	0.4	0.4
No. 2 CWRW	0.06	0.10	0.04	0.04	0.7	0.7
CW Feed	0.1	0.25	0.1	0.1	5	5

* Columns which represent a subtotal of other columns show the columns to be added in parenthesis
The area inside dashed lines refers to factors which are assessed in determining commercial cleanliness.
Total foreign material does not include broken wheat passing through the #5 buckwheat sieve

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