

APPROVED
by Joint Order of the
Ministry of Agrarian Policy of Ukraine and the
Ministry of Economy of Ukraine

No _____ dated _____

METHODOLOGY

of Preparing Grain Supply and Demand Balance Forecasts¹

1. General Provisions

1.1. The Methodology of Preparing Grain Supply and Demand Balance Forecasts (hereinafter referred to as “Methodology”) is intended to be used by central and local government authorities in charge of the preparation of grain supply and demand balance forecasts.

1.2. Grain supply and demand balance forecasts (hereinafter referred to as “balance forecasts”) are systems of indicators characterizing the anticipated supply and use of key grains.

Balance forecasts show, for each grain crop, the flows from production to final use and enable to assess the country’s food security general state and to forecast future developments in agricultural production and food markets.

1.3. The goal of balance forecasts is to model the market situation of key grain crops by forecasting key indicators of these balances for the following marketing year (running from July 1st until June 30th).

1.4. The Ministry of Agrarian Policy of Ukraine is the government agency in charge of the preparation and the publication of balance forecasts.

The Interdepartmental Commission for Preparation of Grain Supply and Demand Balance Forecasts under the Ministry of Agrarian Policy of Ukraine is responsible for the coordination and the calculation of the agreed balance forecasts.

Balance forecasts are prepared and published on a monthly basis, according to the schedule approved by the Ministry of Agrarian Policy of Ukraine.²

The Interdepartmental Commission for Preparation of Grain Supply and Demand Balance Forecasts is composed of representatives of the Ministry of Agrarian Policy of Ukraine, the Ministry of Economy of Ukraine, the State Statistics Committee of Ukraine, the Ukrainian Hydrometeorological Centre of the Ministry of Ukraine of Emergencies, the National Academy of Sciences of Ukraine, the Ukrainian Academy of Agricultural Sciences and professional agro-industry organizations.

1.5. According to the working schedule, the preparation and the publication of balance forecasts for the first forecast for the outlook grain marketing year starts in April of the current year (i.e 1 April 2010 for the Marketing Year 1 July 2010-30 June 2011).

¹ This document is a translation of the Ukrainian methodology which has been discussed at a round table in the Ministry of Agrarian Policy of Ukraine on December 1st, 2009. This translation is provided for information purposes and reflects the official writing style used in the Ukrainian version.

² As a result of the analysis of information flows, the optimal period for the monthly balance update is considered to be from 10th to 15th of each month.

1.6. Balances are made in quantitative terms for the following grain crops:

- a) total grains and legumes;
- b) wheat;
- c) rye;
- d) buckwheat;
- e) millets;
- f) barley;
- g) corn;
- h) oats;
- i) peas.

If necessary, the above list of grain crops may be further detailed.

1.7. The information used to prepare balance forecasts come from: government statistical observations of companies and organizations, from trade, processing industry and agricultural sectors; the observation of households' living conditions and their agricultural activity; customs statistical data; commodity exchange trade data; the registration of export contracts in the specified order; other sources of information on grain supply and use (administrative and internal information, analysis and assessments done by independent experts can be taken into the consideration).

The schedule for the calculation and the updates of the balance forecasts for the outlook indicators is provided in Annex3

1.8. When preparing balance forecasts, the following general scheme, coherent with international recommendations (Food and Agriculture Organization of the United Nations), must be adhered to:

$$\text{DEMAND} = \text{SUPPLY}$$

$$\text{SUPPLY} = \text{STOCK at the beginning of the period} + \text{PRODUCTION} + \text{IMPORT}$$

$$\text{DEMAND} = \text{DOMESTIC CONSUMPTION (human consumption + seeds + livestock and poultry feed + industrial use + losses + other consumption)} + \text{EXPORT} + \text{STOCK at the end of the period}$$

A detailed balance forecast form is provided in Annex 1.

1.9. According to international recommendations (Food and Agriculture Organization of the United Nations) balance forecasts should be calculated for the main product, i.e. including both grain and processed grain products expressed in grain equivalent. When calculating each grain crop balance, processed grain products must be converted into the main product using the appropriate coefficients and conversion factors. These conversion factors are provided in *Annex 2*.

2. Determining components of the Demand

2.1. Human Consumption

The grain and grain products for human consumption include any form of grain used by the country's population for personal consumption.

The human consumption is composed of the production during the marketing year, the imports and the stock consumption. The human consumption of grain and grain products includes flour, cereals, legumes, bread products, pasta and pastries, all calculated in grain equivalent.

The volume of the human consumption is a basic indicator for the calculation of balance forecasts.

The human consumption forecast is calculated as the product of the country's forecasted population in the forecast period by forecasted per capita food consumption of each product.

To assess forecasted per capita food consumption, it is useful to consider the food consumption as functionally dependent on the income in a number of previous years. When calculating forecasted human consumption, the following indicators should also be taken into account: rational per capita consumption standards, forecasted real available income, government regulation of food markets, etc.

2.2. Seeds, livestock and poultry feed is the amount of grain used for agricultural production needs (sowing and animal feeding).

The seed use calculation is based on forecasted grain sowing areas and sowing norms (the average of the actual amounts of seeds used per hectare of sowing area in the last five years). This data is periodically updated with the sowing norms and expert assessments.

The livestock feed use calculation is based on the following data forecasted by the Ministry of Agrarian Policy:

- forecasted average annual livestock and poultry population;
- forecasted productivity;
- amount of feed required for the forecasted production;
- share of concentrated feed in the ration composition.

The amount of grain required for livestock feed in the following marketing year is determined with the need in concentrated feed. Grains used for animal feed are broken down by types according to the state statistical observation data from Form №16-sg "*Agricultural Products Balance for 200__*" available from the State Statistics Committee of Ukraine on a calendar year basis.

The analysis and expert assessment for individual households is based on the share of feed in the total on-farm consumption from the estimated balance of the previous year.

Grains required for livestock feed in individual households are broken down by types according to data received through a sample survey of households' living conditions and activities in rural areas (conducted on a monthly basis by the SSCU).

The amount of feed may be adjusted during the marketing year considering livestock population change in agricultural enterprises and individual households compared to the previous year.

2.3. Industrial use includes the amount of grain used in production of alcohol, malt, etc. and is part of domestic consumption.

When preparing balance forecasts, industrial use is determined with government statistical agencies' reports from the previous years, consultations with professional public organizations of agricultural producers, and expert assessments.

Calculations are based on state statistical observation data obtained with Form №1-grain "*Stocks and Flows of Grains and Oilseeds*" submitted by companies engaged in storage and processing of cereal and oilseed crops (which are owning or leasing storage and processing facilities), and on expert assessments.

2.4. Losses

Losses should be differentiated into production losses and sale losses. Regarding production losses, harvesting losses are not taken into account because production figures are based only on the harvested crops. Losses include weight losses occurred during sorting, etc. Sale losses are determined as losses occurred during storage, transportation, and processing. They include decreases of grain weight caused by the decrease of moisture content, by the reduction of waste and grain additives, and by natural grain weight losses during storage (depending on its duration).

The amount of losses (in all phases, from production to sale) is determined as a share of production represented by the ratio between losses and production amounts for the last five years.

Calculations are based on state statistical observation data concerning grain losses (obtained with Form №16-sg “*Balance of Agricultural Production*”) and on random observations of households’ living conditions.

2.5. Export

Export is the amount of grain (including flour and other processed products in grain equivalent) legally exported during the marketing year (excluding grain transits from other countries).

When preparing balance forecasts, export is considered to be the amount of grain which may be exported during the marketing year once all domestic market needs are fully met.

Forecasted export is determined before the beginning of each marketing year as the difference between the forecasted availability of cereal crops and the domestic demand excluding carryover stock.

During the marketing year, forecasted annual export is adjusted on a monthly basis considering the actual amount of grain (including processed grain products) shipped for export and determined according to customs statistical data.

When monthly adjusting export data, the following factors must be taken into account:

- monthly trends observed for several years (structure);
- actual customs statistical data of the previous month of the forecasted marketing year (monthly);
- information concerning export contracts registered as of the 10th of the current month by the Ukrainian agrarian exchanges (information available from the Ministry of Agrarian Policy).

3. Determining the component of Supply

3.1. Production

Grain production in the marketing period is the main source of the supply in the country.

When compiling production component, annual production is determined with the forecasted grain production in farms of all categories. At the same time, grain yield is expressed in the *clean weight* equivalent.

Forecasted production is based on forecasted sowing areas and average grain yields in recent years.

Forecasted sowing areas for the following marketing year are determined starting from April 1st of the current year based on the state statistical observation data from Form №37-sg “*Agricultural Crops Sowing and Harvesting, and Other Field Work*”, with monthly data updates.

Crop yield is determined by an expert analysis based on the average actual yield of the last five years adjusted to the assessment of crop condition and prospects of development by the Ukrainian Hydrometeorological Institute.

Starting from August of each marketing year, production data is being adjusted considering actual harvest areas and yields based on the state statistical observation data from Forms №4-sg “*Agricultural Crops Sowing Areas*” and №37-sg “*Agricultural Crops Sowing and Harvesting, and Other Field Work*”, and data from field reports gathered by the Ministry of Agrarian Policy of Ukraine.

Final production data is added in the balance in February of the current marketing year based on the state statistical observation data from Form №29-sg “*Agricultural Crops, Fruits, Berries, and Grape Yield as of December 1st, 200 __.*”

3.2. Stocks

Stock at the beginning of the period is the known amount of grain which, at the beginning of the marketing year, is or will be stored in any storage facility.

$$P_t = P_{t-1}, \text{ where}$$

P_t – stock at the beginning of the period;

P_{t-1} – stock at the end of the previous period.

Stock at the end of the period is the known amount of grain which, at the end of the marketing year, is stored in any storage facility. This amount does not include newly-harvested grains (for example, new grains harvested before the beginning of new marketing year).

$$P_t = P_{t+1}, \text{ where}$$

P_t – stock at the end of period;

P_{t+1} – stock at the beginning of the next period.

If possible, stock must be separately calculated for individual households, agricultural producers, grain processing and grain storage enterprises including government reserves.

At the beginning of April of the current year, when preparing balance forecasts for the following year, the *stock at the beginning of the period* is determined as the difference between:

- state statistical observation data from Forms №1-grain “*Availability and Increase of Cereal and Oilseed Crops*”, №1-opt (quarterly) “*Report on Sales and Stocks of Goods (Products) in Wholesale Trade*”, and data gathered through a sample survey of households “*Agricultural performance parameters, grain declaring data as of the beginning of the month of the first balance forecast (April 10th)*”;
- forecasted three-month domestic consumption and forecasted (expected) grain export in the period before the beginning of the marketing year.

The initial forecasts are adjusted monthly until the beginning of the marketing year. Starting from July, the *stock at the beginning of the period* of the balance forecast is compiled using actual data .

Stock at the end of the period is equal to the difference between:

- grain supply;
- forecasted consumption and export for the forecasted marketing year.

It is common to consider that stock at the end of the period is equal to the amount of grain sufficient to meet, at least, two-month domestic consumption requirements, considering provisions of Ukrainian law on food security³.

Stock changes are calculated as the difference between stocks at the end and at the beginning of the period.

Forecasted stock data is adjusted during the year according to the latest operational information, taking into account:

- state statistical observation data and information on grain quantities declared by agricultural enterprises, processing industry, wholesale and retail trade;
- for individual households, this data is determined based on existing sample surveys. It is evaluated using information on trends of production, of stocks (determined by the random observation of households), of income from the payment of work and parcel rents (information from state statistical observation data from form №21-zag “*The Use of Agricultural Production*”), of procurements, etc and using information on households’ living conditions.

³ The sufficient amount of grain resources in a country is the ratio of government grain reserves to domestic consumption. According to the FAO methodology, the minimum acceptable indicator is 17%, which corresponds to 60 days of consumption. – *Methodology of determining main indicators of food security and food security assessment criteria.*

3.3. Import

Import is the amount of grain (including flour and other processed products in grain equivalent) legally imported during the marketing year (excluding grain transits).

Forecasted import is calculated by expert assessment of the amount of grain which must be imported to cover the domestic market deficit (if any). It is monthly adjusted with the actual amounts of grain and processed grain products which have been already imported since the beginning of the marketing year and determined according to customs statistics and monthly trends observed during several years.

Supply and demand balance form

(cereal crop type)

(unit of measurement)

No	Indicator	Formula	Total
A	Stock at the beginning of the period – total	$\Sigma[(A.1.) : (A.n.)]$	
A.1.	Agricultural producers		
A.2.	Grain trade, processing, storage companies		
A.3.	Individual households		
A.n	Other		
I	Supply – total	(1.1.) + (1.2.) + (A)	
1.1.	Production	$1.1.1. \times 1.1.2.$	
1.1.1.	<i>Harvested area</i>		
1.1.2.	<i>Yield</i>		
1.2.	Import		
	<i>including flour grain equivalent</i>		
II	Demand – total	(2.1.) + (2.2.) + (B)	
2.1.	Domestic consumption – total	$(2.1.1.) + (2.1.2.)$	
2.1.1.	Human consumption		
2.1.2.	Other consumptions	$\Sigma[(2.1.2.1.) : (2.1.2.3.)]$	
2.1.2.1.	Seeds, livestock and poultry feed	$(2.1.2.1.1.) + (2.1.2.1.2.)$	
2.1.2.1.1	<i>Seeds</i>		
2.1.2.1.2	<i>Feed</i>		
2.1.2.2.	Industrial use		
2.1.2.3.	Losses		
2.2.	Export		
2.2.1	<i>including flour in grain equivalent</i>		
B	Stock at the end of the period – total	$\Sigma[(B.1.) : (B.n.)]$	
B.1.	Agricultural producers		
B.2.	Grain trade, processing, storage companies		
B.3	Individual households		
B.n	Other		

Conversion coefficients

Bread product converted to the flour equivalent	
Bread	0.736
All flour types	1
Pasta products	1.031
Cereal -and pasta-based semi-finished and culinary (pastry) products	0.7
Flour products (flour in grain equivalent)	1.330
<i>including semolina</i>	1.368

Schedule for the calculation of the balance forecast indicators

Balance indicators	Month														
	Year N-1						Year N								
	April	May	June	July	August	September	October	November	December	January	February	March	April	May	June
Harvest area	Actual data concerning winter crops (Form №37-sg)	Including final data concerning perished winter crops (Form №37-sg)	Actual data from Form №37-sg	Form №4-sg excluding the five-year average difference between the sowing area from Form №4-sg and the harvest area.	Form №37-sg			Unchanged data			Data update from Form №29-sg	Unchanged data			
	- assessment of perished winter cereal crops from the Hydrometeorological Institute of Ministry for Emergencies, including data from Form №37-sg or the reporting of the Ministry of Agrarian Policy			Monitoring the harvest area									-assessment of perished winter cereal crops from the Hydrometeorological Institute of Ministry for Emergencies, or from the reporting of the Ministry of Agrarian Policy		
	+ spring wheat sowing forecast (from the Ministry of Agrarian Policy according to regional data)	+ spring wheat sowing data from Form №37-sg											+ spring wheat sowing forecast (from the Ministry of Agrarian Policy according to regional data)	+ spring wheat sowing data from Form №37-sg	

Balance indicators	Month															
	Year N-1						Year N									
	April	May	June	July	August	September	October	November	December	January	February	March	April	May	June	
Crop yield	Average crop yield during the last 5 years (separate winter and spring wheat data)	Average crop yield during the last 5 years (separate winter and spring wheat data) OR forecasted data from Ukrainian Hydrometeorological Institute	Ukrainian Hydrometeorological Institute + Ministry of Agrarian Policy forecasts (based on regional data)		Ministry of Agrarian Policy forecasts (based on regional data) considering actual SSC yield data from Form №37-sg (bunker weight recalculated in terms of registered weight)			Unchanged data	Updated data from Form №29-sg			Unchanged data				
					Monitoring the crop yield according to Form №37- sg											
Production	Area X yield								N/A			Area X yield				
Export	<i>Calculations and updates are done on a monthly basis according to the Methodology</i>															
Import	<i>Calculations and updates are done on a monthly basis according to the Methodology</i>															
Consumption																
Human consumption	Calculated as the product of the country's forecasted population in forecast period by forecasted per capita food consumption index, with regular updates															
Industrial use	Initial data is calculated as the average share in production during the last 5 years from Forms №1-grain and №29-sg	Recalculated considering updated production figures			Recalculated considering updated production figures and actual processing data from Form №1-grain			Recalculated considering actual processing data from Form №1-grain								

Balance indicators	Month														
	Year N-1							Year N							
	April	May	June	July	August	September	October	November	December	January	February	March	April	May	June
Seeds	Calculated as the product of forecasted grain sowing area and sowing norms (expert assessment based on the five-year average actual amount of seed sowed per hectare of sowing area and sowing norms) and including insurance stock		Updated while changing forecasted grain sowing area.					Updated according to the amount of actual winter crop sowings	Updated while changing forecasted spring crop sowing area				Updated according to the amount of actual spring crop sowings	Actual grain crop sowings	Updated actual grain crop sowings
Livestock and poultry feed	Determined based on information about forecasted average annual livestock and poultry population, forecasted productivity, amount of feed required for production purposes, percentage of concentrated feed in animal feed ration		Updated while changing forecasted parameters		Monthly expert update considering actual parameters										
Losses	Share of production for the last 5 years									Actual data	N/A				

Balance indicators	Month														
	Year N-1						Year N								
	April	May	June	July	August	September	October	November	December	January	February	March	April	May	June
Stock at the beginning of the period	Carryover stock including data from Form №1-grain and grain declaring data	Updated data including data from Form №1-grain and grain declaring data		Final data from Form №1-grain for 6 months registered for previous marketing year + grain declaring data. Consumption indexes are recalculated	N/A										
Stock at the end of the period	Determined as two-month amount of domestic consumption						Determined as two-month amount of domestic consumption, updated considering actual data for the 1 st quarter	Unchanged data	Determined as two-month amount of domestic consumption, updated considering actual data for the 1 st half of year	Unchanged data	Determined as two-month amount of domestic consumption, updated considering actual data for 3 quarters	Data update			