РУСАГРО
ЛИДЕР АГРОБИЗНЕСА

FEED AND ADDITIVES OPPORTUNITIES

Commercial Advisor to the CEO
Tatiana Pukhtel

COMPANY OVERVIEW

Sunflower oil making

№1 Manufacturer of sunflower oil in Russia

Share in production 12%

Sugar production

№2 Manufacturer of sugar in Russia

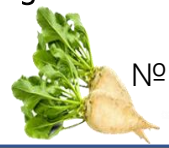
Share in production 15%

Red meat production

№3 Manufacturer of red meat in Russia

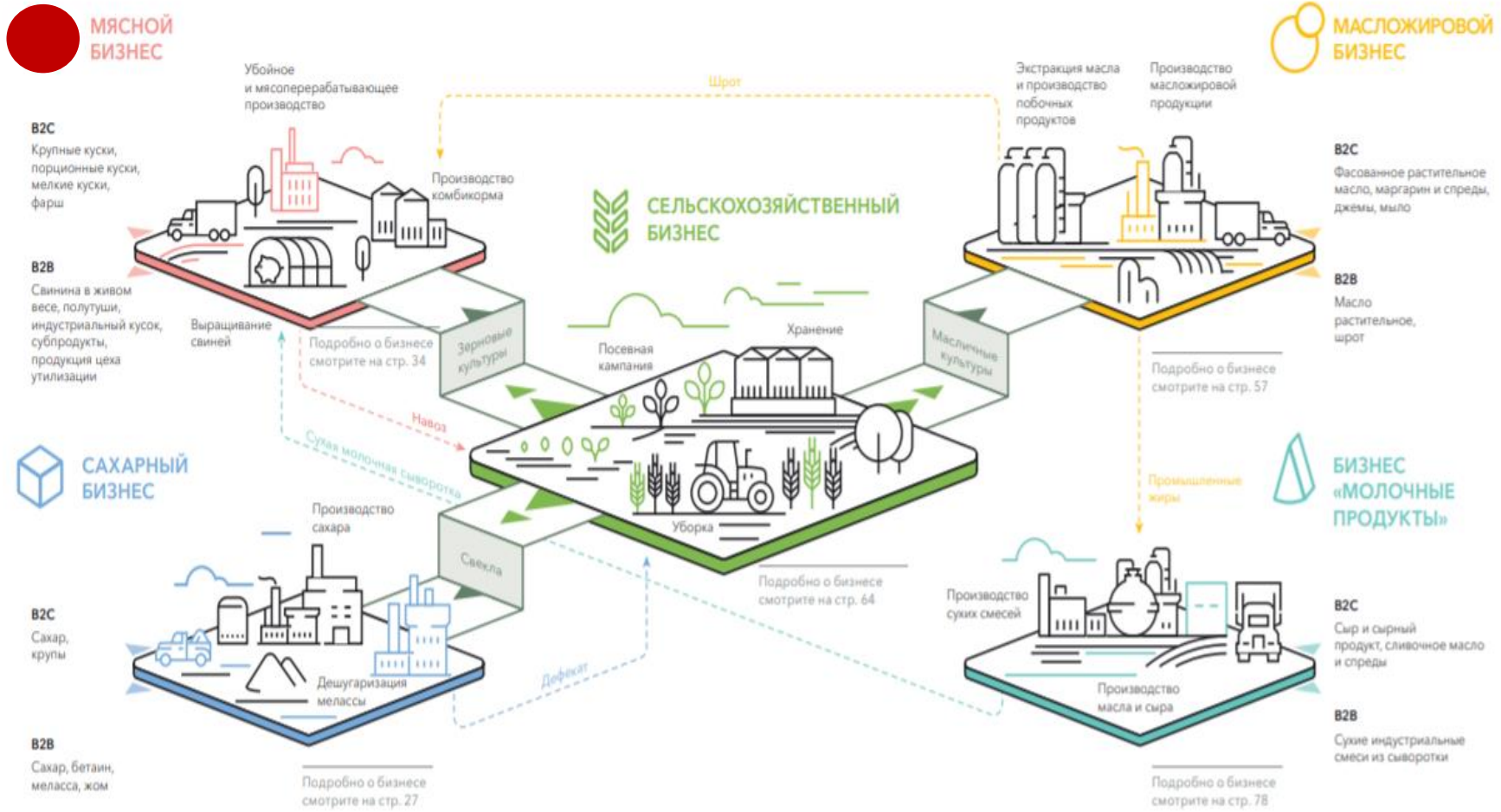
Share in production 5,5%

Agricultural lands



№4 Land owner in Russia

685 thousand hectares in use



The RUSAGRO Group of Companies is one of largest vertically integrated agricultural holdings in Russia. The company occupies significant share of domestic oil and fat production, agricultural goods, sugar and meat (2023-2024 data).

MAIN FEED PRODUCTS FOR IRANIAN MARKET AND ASSET'S LOCATION

РУСАГРО
ЛИДЕР АГРОБИЗНЕСА

Barley **Feed Wheat** **Corn**

Total sales in 2023 -7,2 mln MT
Grain production – 1,5 mln MT

Crude Sunflower Oil **Sunflower Meal**
Whole Milk Replacers

Total sunflower oil – 0,6 mln MT
Sunflower meal production – 700 KMT

Sugar Beet Pulp **Liquid Betaine**

Total sugar production – 1 mln MT
Pulp production – 235 KMT
Liquid Betaine – 27 KMT

6 Elevators

5 Grain sites

9 Sugar plants

6 Oil-extraction plants

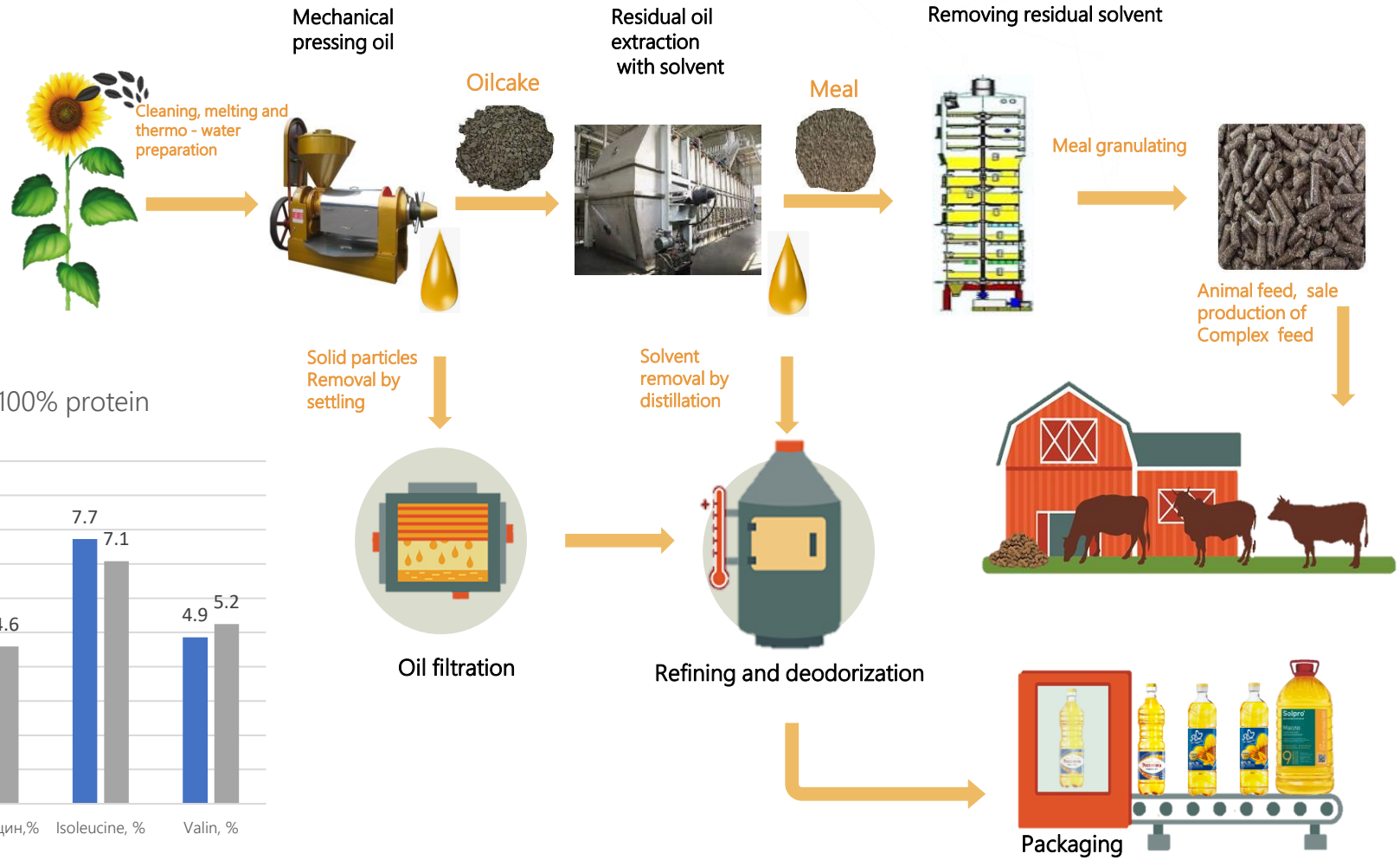
6 Oil and fats plants

SUNFLOWER MEAL BY RUSAGRO

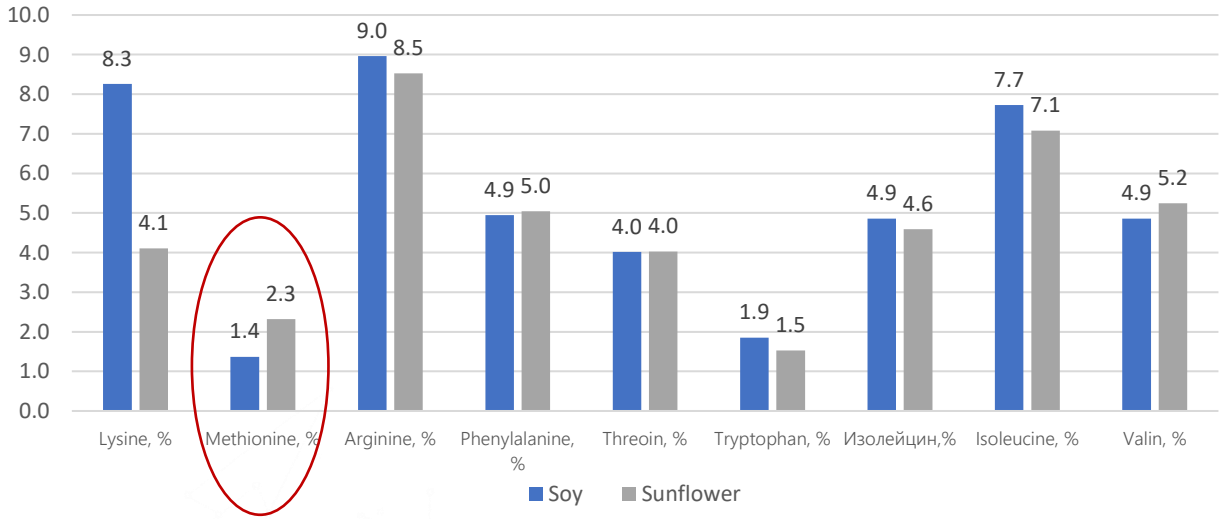
Meal is by-product of vegetable oil production. It is obtained after pressing and extracting oilseeds. Meal contains amino acids, vitamins, natural proteins that are more complete than cereal proteins.

Chemical composition and nutritional value of high-protein sunflower and soybean meal

Parameter	Sunflower meal	Soybean meal
Raw protein at dry weight not less, %	39	43-45
Raw fiber at dry weight no more, %	15-21	4-8
Raw fat at dry weight not less, %	0,7	0,5-2,0
Exchange energy, kCal per 100 g	210	249
Exchange energy, MJ	11,7	12,5
Digestibility (balance), %	75,83	80,24



Amino acid score of soybean and sunflower meal per 100% protein



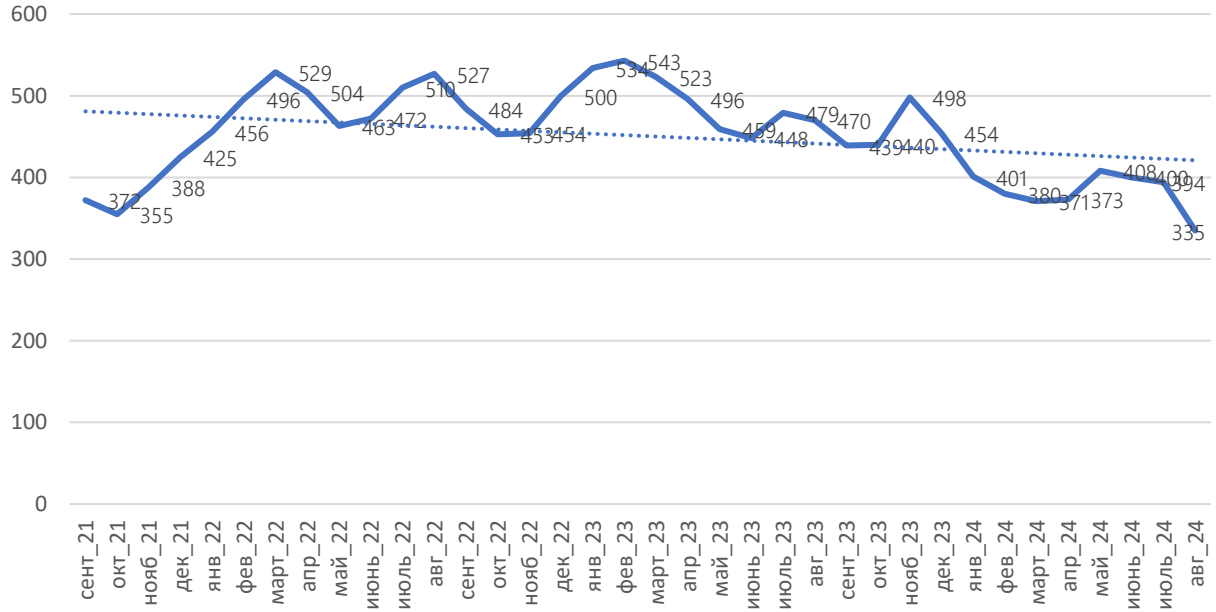
WORLD MARKET OF SOYBEAN AND SUNFLOWER MEAL

GLOBAL SOYBEAN MEAL MARKET IN 2023/2024 ESTIMATED AT USD 120.3 BILLION, 261.6 MILLION TONS
GLOBAL SUNFLOWER MEAL MARKET IN 2023/2024 ESTIMATED AT USD 6.98 BILLION, 23.5 MILLION TONS

Global soybean meal market in 2023/2024 marketing year:
- 261.6 million tons in volume terms;
- 120.34 billion USD in monetary terms.

Current price as of 09.2024 - 327.9 USD/ton (on the Chicago Exchange).

Dynamics of world prices for soybean meal, 21/22-23/24 USD/ton*

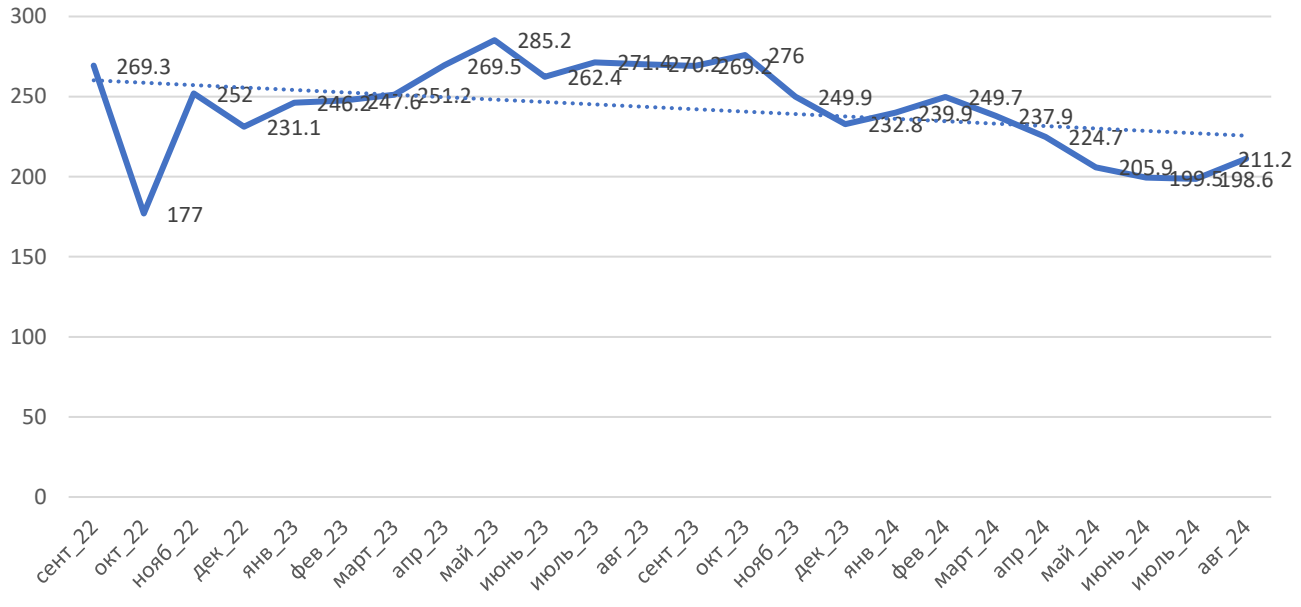


The soybean meal market projected to grow CAGR of 4.6% over the forecast period to reach USD 150.89 billion in MY 2029/30
The main growth drivers will be:
increasing demand for high-protein feed;
ОЭСР-ФАО forecasts that global white meat supply will increase over the forecast period to reach 374 million tonnes by 2030 (+14% by 2022 - 328 million tonnes).

World sunflower meal market in 2023/2024 marketing year:
- 23.5 million tons in physical terms;
- 6.98 billion USD in monetary terms.

The current price of Russian export meal as of 09.2024 is 222.3 USD/ton.

Dynamics of indicative prices for Russian export meal 22/23-23/24 USD/ton*



The sunflower meal market projected to register CAGR of 2.7% during the forecast period to reach USD 7.97 billion in MY 2029/30.
The growth drivers are similar to the soybean meal market:
The European region will be the dominant region in the sunflower meal market.
Russia - will be the major sunflower meal producer in the region.

EXAMPLE REPLACING SOYBEAN MEAL WITH SUNFLOWER MEAL IN BROILER RECIPES

РУСАГРО
ЛИДЕР АГРОБИЗНЕСА

Without significant loss of nutritional value in broiler recipes, soybean meal can be replaced with sunflower meal.

In "Growth" recipes, by 20% of the soybean meal share;
In "Finish" recipes, by 26% of the soybean meal share.

The use of sunflower meal helps to reduce the share of expensive synthetic methionine.

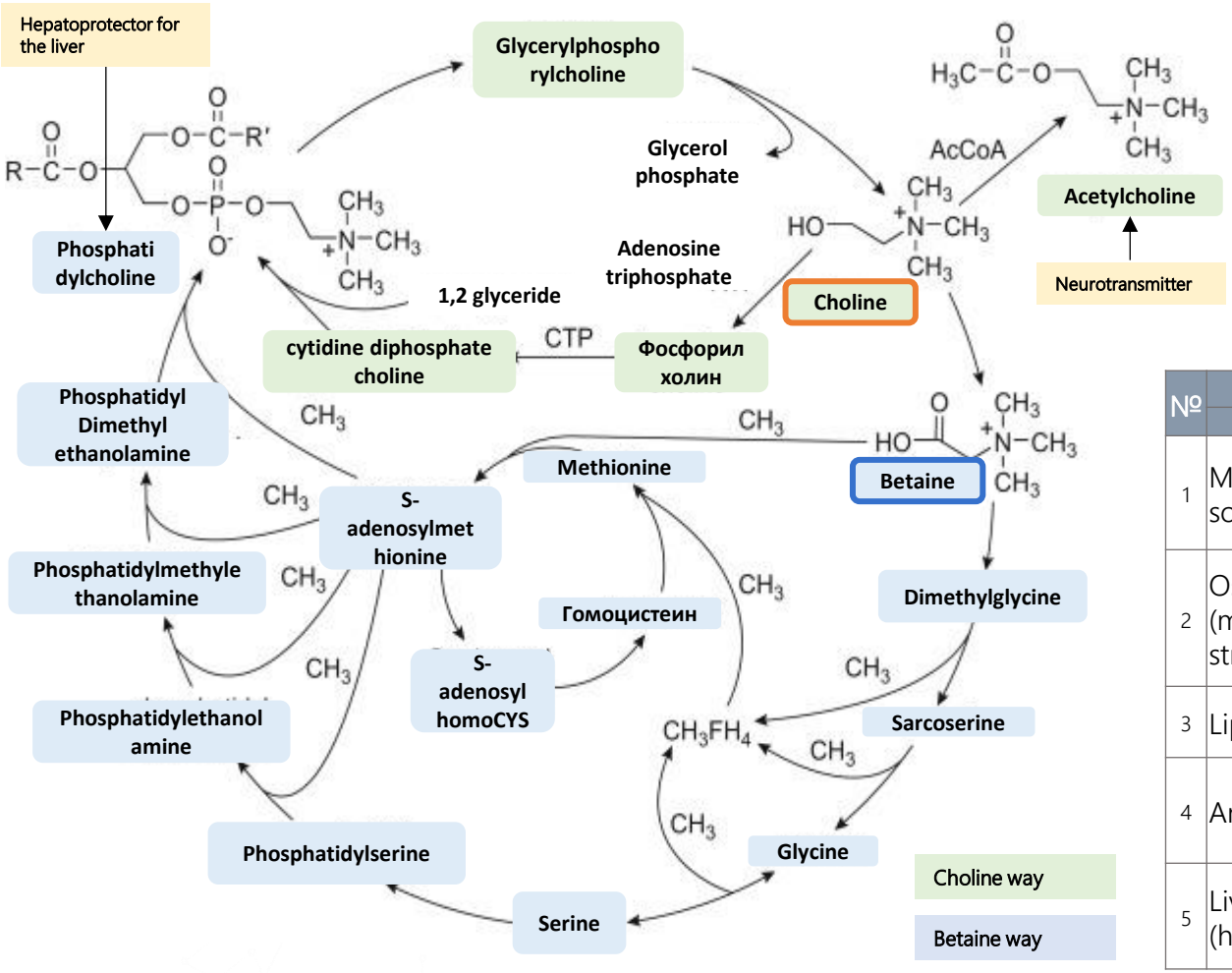
Since sunflower meal contains less lysine than soybean meal, its level must be compensated for with lysine sulfate.

№	Description	Price Rub/ton	Price USD/ton	Growing Soybeans 25%	Growing Soybean replacement 20%	Final Soybean 14,9%	Final soybean replacement 26%
	1	2	3	4	5	6	7
1	WHEAT	11400,00	122,77	2,0%	7,0%	2,0%	2,0%
2	BARLEY	10000,00	107,69	2,0%	2,0%	0,0%	0,0%
3	CORN	11000,00	118,46	45,8%	43,0%	54,5%	54,5%
4	WHEAT BRAN	8682,00	93,50	5,1%	3,7%	3,6%	3,7%
5	**SOYBEAN MEAL 44%**	**30000,00**	**323,07**	**25,0%**	**20,1%**	**14,9%**	**10,9%**
6	SUNFLOWER CAKE 36%	15000,00	161,53	3,1%	2,1%	7,8%	7,8%
7	**SUNFLOWER MEAL 39%**	**21000,00**	**226,15**	**0,0%**	**5,0%**	**0,0%**	**4,0%**
8	MEAT/BONE MEAL 50%	52727,00	567,81	5,0%	5,0%	4,0%	4,0%
9	SUNFLOWER OIL	71636,00	771,44	5,5%	5,5%	5,0%	5,0%
10	FEED YEAST RP 38%	28636,00	308,38	3,0%	3,0%	5,0%	5,0%
11	LYSINE SULFATE	116591,00	1255,56	0,5%	0,6%	0,5%	0,6%
12	DL-METHIONINE 98,5%	349500,00	3763,73	0,4%	0,3%	0,3%	0,1%
13	L-THREONINE(98%	169000,00	1819,94	0,2%	0,2%	0,2%	0,2%
14	L-VALIN 96,5%	233333,00	2512,74	0,5%	0,5%	0,5%	0,5%
15	LIMESTONE FLOUR	4167,00	44,87	0,8%	0,8%	1,2%	1,2%
16	SHELL FLOUR	6363,00	68,52	0,5%	0,5%	0,0%	0,0%
17	TOXAUT FORTE РФ+	73637,00	792,99	0,2%	0,2%	0,0%	0,0%
18	Premix BROILERS 1-4 weeks	90909,00	978,99	0,5%	0,5%	0,0%	0,0%
19	Premix BROILERS 4-6 weeks	90909,00	978,99	0,0%	0,0%	0,5%	0,5%
20	TOTAL, %			100,0%	100,0%	100,0%	100,0%
21	Production cost, RUB/t			25 282,23 ₽	24 895,18 ₽	22 779,28 ₽	22 419,28 ₽
22	Production cost, USD/т			$272,26	$268,09	$245,31	$241,43
23	Receipture savings Δ, USD/т				-$4,17		-$3,88
24	Exchange energy BROILERS	KCal/100g		304	303	309	307
25	RAW PROTEIN	%		21,34	20,85	18,91	18,60
26	RAW FAT	%		8,76	8,57	8,69	8,67
27	RAW FIBER	%		4,22	4,43	4,30	4,68
28	LYSINE	%		1,30	1,28	1,12	1,07
29	METHIONINE	%		0,95	0,94	0,81	0,82
30	THREONINE	%		0,96	0,93	0,87	0,86
31	THRIPTOPHANE	%		0,23	0,23	0,20	0,20
32	Ca	%		0,99	0,99	0,91	0,91
33	P	%		0,57	0,57	0,55	0,57

LIQUID BETAINE

BETAINE IS A PRECURSOR OF CHOLINE, THEREFORE ENERGY EXPENDITURE IN BODY FOR CHOLINE TRANSFORMATION INTO BETAINE WILL BE LOWER. THIS CREATES PREREQUISITES FOR REPLACING POSSIBILITY CHOLINE WITH BETAINE.

Metabolic pathway of CHOLINE and BETAINE



Liquid betaine produced by RUSAGRO:

- ✓ Increases animal resistance to thermal and oxidative stress;
- ✓ Reduces feed costs per unit of production, improves digestion and utilization of nutrients, increases farm animals' productivity;
- ✓ Has hepatoprotective properties, helps maintain liver health;
- ✓ Is a donor of methyl groups in methionine metabolism, participates in detoxification, energy production, immune system function, synthesis and regulation of hormones;
- ✓ Efficiently replaces choline chloride (60%) in ratio 1.32:1.

№	Function	Importance for body
	1	2
1	Methyl groups source	Replenishment of the essential amino acid - methionine. DNA synthesis, gene regulation. **Result:** reduced conversion and increased growth.
2	Osmoprotector (maintaining cell structure)	Animal organism functioning. It necessary to maintain cells health and whole organism. **Result:** excess water consumption, decreased conversion and increased gain.
3	Lipid metabolism	Метаболизм жиров в процессе метилирования. **Результат:** снижение конверсии и повышение прироста.
4	Antioxidant	Participates in the detoxification process, removing toxins from the body. Protects cells from oxidative stress. **Result:** increased live weight gain.
5	Liver protection (hepatoprotector)	Helps protect liver functions (filtering toxins, providing body with glucose) from mycotoxins. **Result:** reduced conversion and increased gain.

Adenosylmethionine is a coenzyme involved in methyl transfer reactions;
Homocysteine is an amino acid biosynthesized from methionine by removing methyl group. It can be converted back to methionine with B vitamins help.

EXPERIMENT RESULTS ON CALVES DURING MILK PERIOD GROWTH/POULTRY (ROSS 308)

РУСАГРО
ЛИДЕР АГРОБИЗНЕСА

Liquid betaine use in feeding calves during milk growth period as starter compound part contributes to:
Increase in average daily gain by 96g (22%) relative to the group without additives and by 23g (4.5%) relative to the group receiving 60% choline chloride;
Reduce feed conversion by 0.55 and 0.12 kg.

At 40 days of rearing, reliable increase in experimental groups live weight was noted relative to the groups that did not receive choline chloride and betaine by 112.3 g (3.95%) and 98.79 g (3.5%);

An increase in average daily gain by 2.5 g (3.5%) relative to the control;
The difference in average daily gain between the group receiving liquid betaine and choline chloride is -0.3 grams (0.4%);

In the experimental groups decrease in feed conversion by 0.05 kg (3%) was noted.

Calves zootechnical indicators during the milk growing period

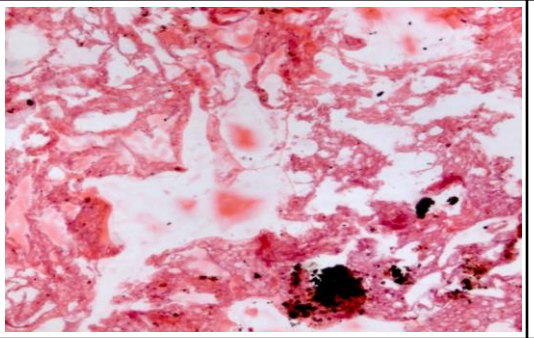
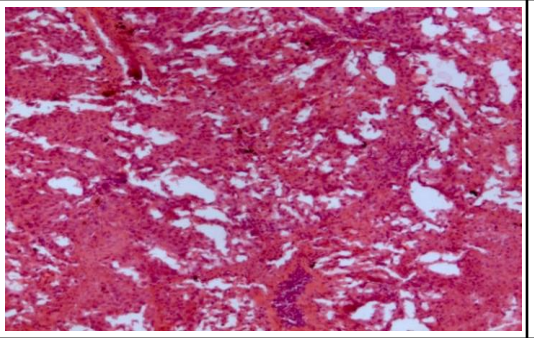
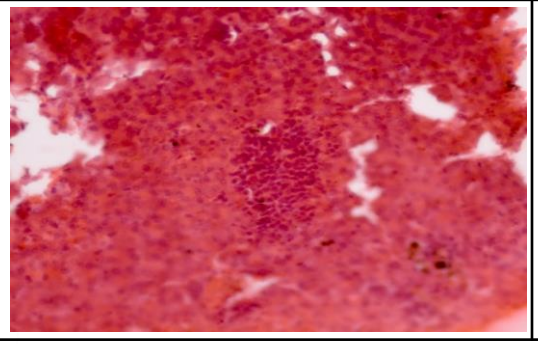
№	Indicator	Group		
		No additives	Choline Chloride	Liquid betaine
	1	2	3	4
1	Quantity of animals	5	5	5
2	Calves average live weight at the beginning of the experiment, kg	57,8±1,9	57,5±1,9	57,0±1,6
3	Calves average live weight in 2 months , kg	70,9±1,6	72,8±1,1	73,0±1,7
4	Gross gain, kg	13,1±2,8	15,3±2,8	16,0±2,2
5	Average daily gain, g	437±0,52	510±25	533±34*
6	% to control live weight gain	--	1,4	2,0
7	Feed consumption amount (dry feed) kg	39	39	39
8	Feed conversion, kg	2,98	2,55	2,43
9	Exchange energy costs per 1 kg of gain, MJ**	36,5	31,21	29,74

Zootechnical indicators in broiler growing

№	Indicator	Group		
		No additives	Choline Chloride	Liquid betaine
	1	2	3	4
1	**Live weight by periods:**			
2	*0 days*	40,43±0,40	40,40±0,20	40,33±0,22
3	*14 days*	577,55±9,49	604,08±9,54	584,20±10,15
4	*28 days*	1 704,13±23,70	1 783,33±28,03**	1 746,55±26,84
5	*40 days*	2 837,54±43,04	2 949,87±50,23*	2 936,33±35,70*
6	Average daily gain, grams	69,92	72,73	72,40
7	Feed consumed, kg	180,501	182,454	182,334
8	Weight gain, kg	109,047	113,429	112,904
9	Conversion	1,66	1,61	1,61
10	**Keeping:**			
11	*0 days*	100	100	100
12	*14 days*	100	100	100
13	*28 days*	100	97,5	100
14	*40 days*	97,5	97,5	97,5

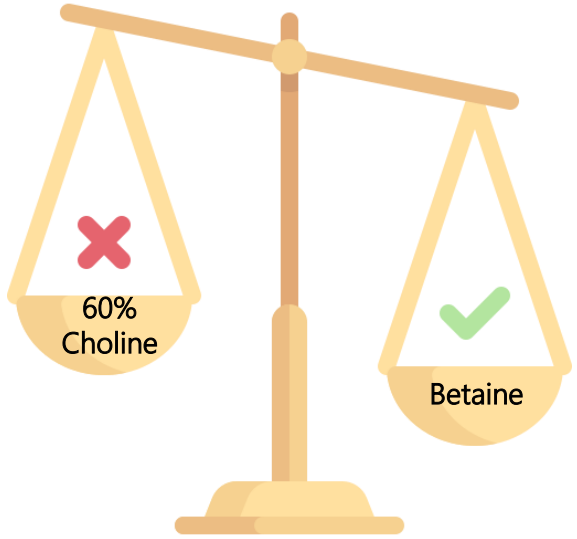
Note: here and further *- p< 0.05;
**assessment of the exchange energy by digestible nutrients

LIVER HISTOLOGICAL EXAMINATION

№	Group	Histology	Description
	1	2	3
1	Control (without additives)		The liver is hyperemic. There is stratification with granular zones. Initial stage of liver fatty degeneration. Histological examination revealed necrosis.
2	1-experimental (60% choline chloride)		Liver has minor structural changes during transition to fatty stage - hepatoprotector use required. The parenchyma expanded. Granular lumps are noted. Initial stage of hepatosis. Physiologically, the liver is functioning.
3	2-experimental (liquid betaine)		All internal organs correspond to physiological fish state with normal feeding and correct biotechnological maintenance. Glycogen in the liver is no more than 12%. When examining histology, the liver is characterized as dense, without physiological deviations.

CONCLUSION AND RECOMMENDATIONS

1. Increase in imported feed share;
2. Dependence from exchange rate;
3. Contains chlorine (toxicity, oxidative stress, liver disease, metabolic disorders);
4. "Dusty" component in compound feed production;
5. Less effective than liquid betaine.



1. Native product, does not contain "chemicals";
2. Helps strengthen granules, reducing "shedding";
3. Increases productivity of agricultural animals;
4. Has pronounced hepatoprotective properties.

Liquid betaine produced by Rusagro is: increases resistance to stress, safety, productivity farm animals and nutrients absorption in feed; reduces feed costs per production unit and oxidation-reduction stress; having hepatoprotector properties, helps maintain liver health.

Liquid betaine norms recommendations for farm animals diets

№	Animals type	Age group	Дозировка, кг/т корма
	1	2	3
1	Cattle	Dairy growing period calves	0,53
2	Agricultural poultry	Broilers from 0 to slaughter	1,32
3	Aquaculture	Young fish	1,05

РУСАГРО
ЛИДЕР АГРОБИЗНЕСА

Nutrilactpro

Fro calves

NUTRILACTPRO milk replacers line for calves produced from our own raw materials, all ingredients undergo quality control in our own laboratory. Carefully selected dairy ingredients contain protein and fat in forms that are easily digestible by calves in the milk period of growth. Milk replacer also includes vitamin and mineral premix and probiotic to meet the needs of rapidly growing calves and improve immunity.

с 4 дня жизни	с 14 дня жизни	с 21 дня жизни	с 30 дня жизни
NEW	START	GROWTH	UPGROWTH
Milk components content 95 %	Milk components content 92,2 %	Milk components content 74 %	Milk components content 64,2 %
Raw protein 20 %	Raw protein 18 %	Raw protein 18 %	Raw protein 19 %
Raw fat 18 %	Raw fat 16 %	Raw fat 16 %	Raw fat 16 %
Raw fiber, no more 0,02 %	Raw fiber, no more 0,04 %	Raw fiber, no more 1,2 %	Raw fiber, no more 1,5 %
Lactose 44 %	Lactose 35 %	Lactose 25 %	Lactose 21 %

NUTRILACTPRO milk replacers have been developed to be easy to mix and have an excellent and characteristic mild milk taste – important characteristics for stabilizing milk replacer intake by young calves.