



## ADVANCED GRAIN PROCESSING WITH LYSINE AND GLUTEN PRODUCTION

### PROJECT

There is provided a project on **building a modern grain processing plant with lysine and gluten production.**

The project is worth of implementation due to the following factors:

- World lysine market totals **USD 3,9 bn** and annually grows by **7%** on average. World gluten market totals **USD 1,8 bn** with annual average growth rate of **4%**. World starch imports are **USD 3,4 bn**.
- Demand for lysine in Russia totals **USD 117,7 mn** and grows by **15%** per year on average.
- Share of lysine in total basic amino acids consumption in the world amounts to **60-70%**.
- Lysine is entirely imported by all former Soviet countries, thus building the plant will be import-substituting.
- Capital expenditures for the project may total around **USD 175 mn** with profitability of **17%** and IRR app.**15%**.

### MARKETS

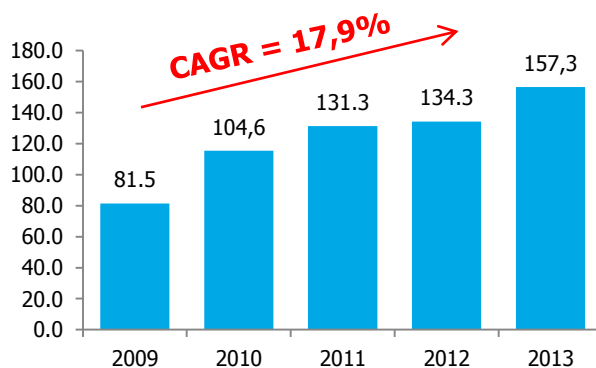
#### Internal market of Belarus:

- Imports of lysine in Belarus in 2013 totaled about **7 thou t** (**USD 12,6 mn**), gluten – **1 thou t** (**USD 1,6 mn**), starch – **8,2 thou t** (**USD 5,2 mn**).
- Demand for lysine is projected to reach **12 thou t** by 2015.

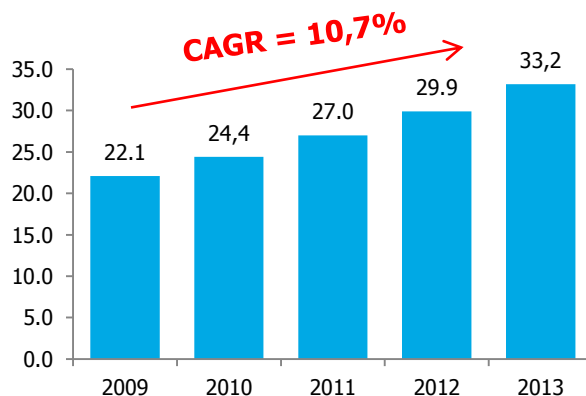
#### CIS countries:

- Imports of lysine in Russia in 2013 totaled about **65 thou t** (**USD 117,7 mn**), gluten – **1,85 thou t** (**USD 2,3 mn**), starch – **42 thou t** (**USD 29,3 mn**).
- Demand for lysine in Russia is projected to reach **70 thou t** by 2015.
- Demand for lysine in Ukraine in 2012 totaled around **15 thou t** (**USD 27 mn**), gluten – **1,1 thou t** (**USD 1,7 mn**), starch – **10,2 thou t** (**USD 6,3 mn**).
- Imports of lysine in Ukraine in 2013 totaled about **15 thou t** (**USD 27 mn**), gluten – **1,1 thou t** (**USD 1,7 mn**), starch – **10,2 thou t** (**USD 6,3 mn**).
- Demand for lysine in Ukraine is projected to reach **18 thou t** by 2015.

Aggregated lysine market in Russia, Ukraine and Belarus



Gluten market in Russia, thou t



## MARKET OPPORTUNITIES

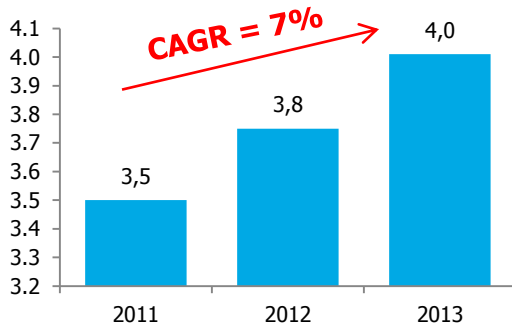
### Global opportunities:

- Global lysine market totaled **USD 3,9 bn** in 2013, gluten market – **USD 1,8 bn**.
- World's starch imports totaled app. **USD 3,7 bn** in 2013, annual average growth rate was **9,1%**.
- Annual average growth rate of global lysine market is **7%**, gluten market – **4%**.
- World lysine market is projected to reach **USD 5,9 bn** by 2018 with annual average growth rate of **9,1%**.
- World gluten market is projected to reach **USD 2,1 bn** by 2016 with annual average growth rate of **4%**.
- World starch market is projected to reach **USD 6,1 bn** by 2017 with annual average growth rate of **12,4%**.

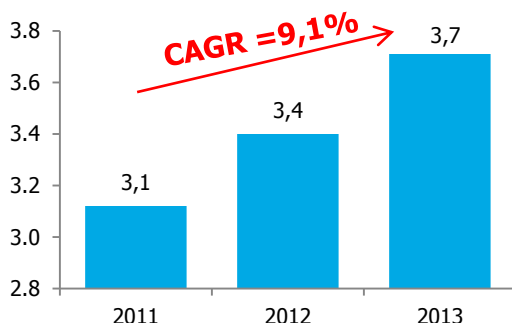
### Local opportunities:

- Russian lysine market grows by **15%** a year on average, gluten market – by **10,7%**, starch market – by **12,1%**.
- Wheat quality in Russia and Belarus is not sufficient enough, which preconditions high demand for gluten in these markets.
- Demand for lysine is formed basically by livestock farming.
- As of beginning of 2013, there were **1534** agricultural organizations and **2436** farms operating in Belarus.
- Livestock in 2013: about **4,5 thou** head of cattle, **4,3 thou** head of pigs, **43,5 mn** head of poultry.
- Annual growth of agricultural industry in Belarus total app. **5-6%** which is positively influences demand for lysine.
- In Belarus subsidy of agriculture accounts for **18%** of total agricultural output. In 2013 state support totaled **USD 3 bn**.
- Share of agricultural output in GDP is app. **8,5%**.
- In Belarus around 40 companies are engaged in mixed fodder production, output growth annually increases by **8-12%**.

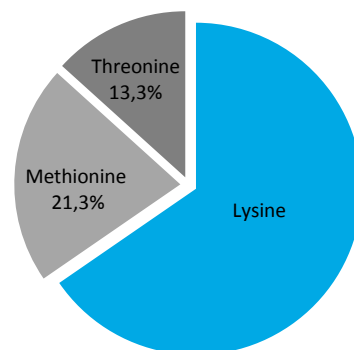
World lysine market, USD bn



World starch market, USD bn



Amino acids global consumption structure, 2013



## INVESTMENT OPPORTUNITIES

- Capex for the project may total around **USD 175 mn**.
- IRR проектов по производству лизина около **15%**.
- Payback period is **6 years**.

## POTENTIAL INVESTORS

Lysine producers, focused on output expansion and consolidation of a stand on European and Eastern European markets - Russia, Ukraine and Belarus, in particular.

Amino acids producers, aimed at the product range enlargement and market consolidation.

Agricultural holdings, fodder mills and farms, focused on launching new capacities.

Meat production (carcass weight) per capita in 2012, kg

