



## 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

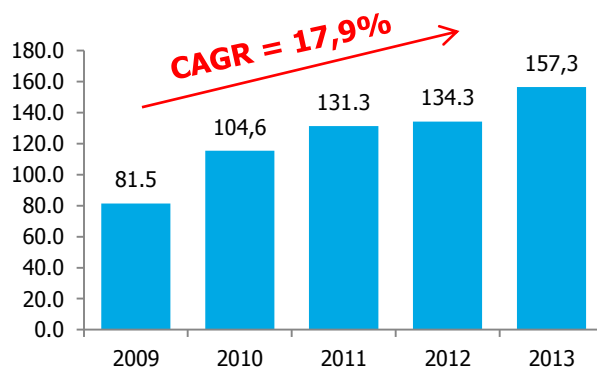
#### Internal market of Belarus:

- 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.

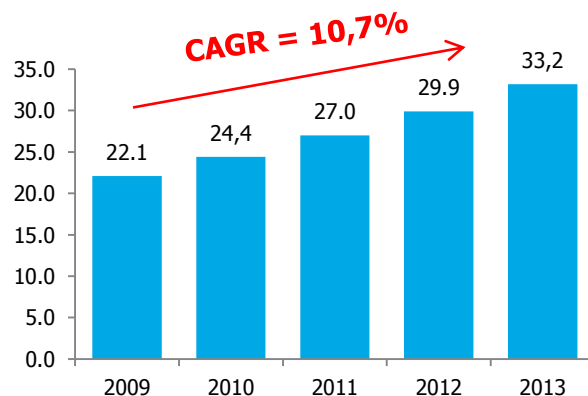
#### CIS countries:

- 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

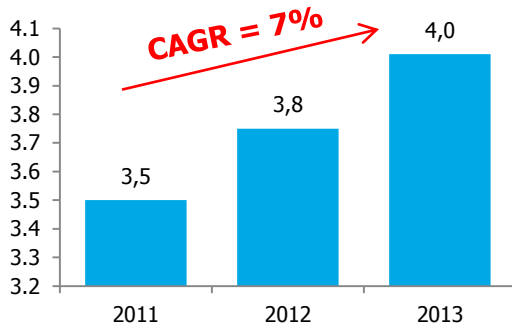
### Global opportunities:

- 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%**.

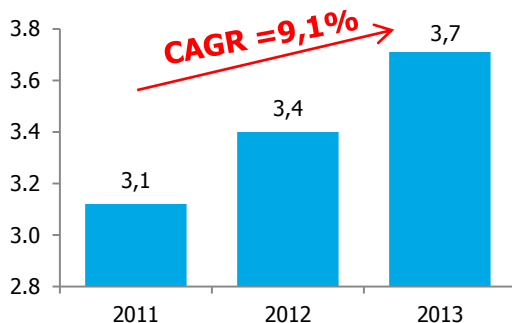
### Local opportunities:

- 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 paltry.
- 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%**.

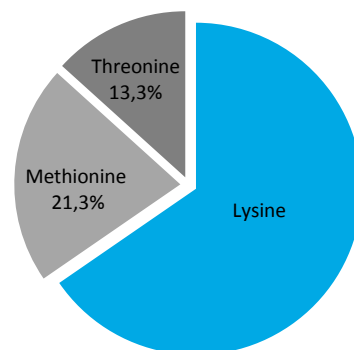
World lysine market, USD bn



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

