Project ENERGYFEED „Development and assessment of the sustainable basis for economic, productive and biosafe livestock nutrition system utilizing the Poland's natural resources, and particularly the modern rye varieties", founded from The National Centre for Research and Development resources, under the strategic program „Natural environment, agriculture and forestry" BIOSTRATEG,
on the basis of the contract No. BIOSTRATEG2/297910/12/NCBR/2016.

The effect of the use of population or hybrid rye in feed compounds on swine fattening performance

T Schwarz, M Mucha, J Lasek, R Tuz, M Małopolska, J Nowicki

University of Agriculture in Kraków, Poland

National Research Institute of Animal Production, Balice, Poland

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The questions about rye are:

1. What are the main advantages and
2. What are the main disadvantages

in animal feeding and nutrition

especially in monogastric animals

3. What – advantages or disadvantages finally exceeds

Several points of view:

1. Chemical composition of grain – nutrients 👍 👎
2. Digestibility of nutrients 👎 comes from…
3. Chemical composition of grain – antinutrients 👎 but…
4. Health and welfare promoteurs 👍
5. Performance of animals fed rye 👍 👎
6. Economical effects of rye feeding 👍

Advantages 👍 = 4 **Disadvantages 👎 = 4**

Is rye always the same cereal?

1. Population rye – less yield but what about nutritional value?
2. Hybrid rye – high yield but what about nutritional value?
3. NN rye – nothing is known!!!
4. Mixed market rye – nothing is known!!!

The aim of the study

The main purpose of the study was to determine if the use of large amount of population or hybrid rye grain as feedstuff can influence fattening performance of pigs

Material and methods

- 125 polish landrace pigs. 30 kg of initial b.w.
- Control group: 0% rye. W+B. (n=25)
- Experimental group 1: 40% pop. rye+W+B (n=25)
- Experimental group 2: 60% pop. rye+W+B (n=25)
- Experimental group 3: 40% h. rye+W+B (n=25)
- Experimental group 4: 60% h. rye+W+B (n=25)
- Isocaloric and isoprotein diets
- Fattening period until 100 ± 3 kg of b.w.

Material and methods

- Fattening according to Pig Performance Testing Station (SKURTCh) metohodology
- Individual housing
- Feeding *ad libitum*
- Data analysis:
  - individual daily gains
  - individual feed intake and conversion rate
  - slaughter performance

Nutritional value of diets

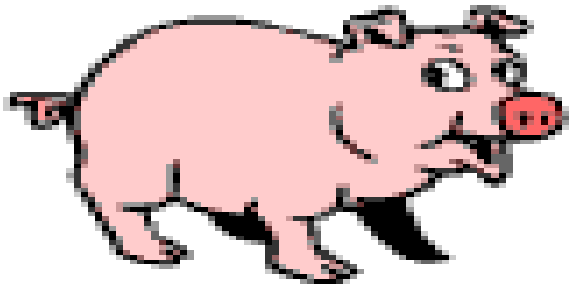
Parameter	Control	Exp. 1	Exp. 2	Exp. 3	Exp. 4
Grower					
Crude protein (%)	18.56	19.10	19.06	18.49	18.69
Lysine (%)	0.875	0.974	0.987	0.962	0.957
Crude fat (%)	2.36	2.29	1.83	2.45	2.35
Starch (%)	56.20	45.54	45.42	49.13	48.84
Simple sugars (%)	6.43	8.38	9.60	10.16	11.33
Finisher					
Crude protein (%)	16.46	16.61	16.79	16.94	16.63
Lysine (%)	0.793	0.880	0.886	0.865	0.889
Crude fat (%)	2.61	1.82	1.79	2.49	2.72
Starch (%)	54.03	48.75	47.32	52.85	50.55
Simple sugars (%)	6.56	8.21	9.91	9.02	9.96

Results of fattening

Parameter	Control	Exp. 1	Exp. 2	Exp. 3	Exp. 4
Daily gains (g)	934±160	943±150	931±115	989±159	984±234
Final body weight	101.7^{AB}±2.1	101.2^{A}±2.0	101.1^{A}±2.1	102.8^{B}±1.0	102.1^{AB}±2.2
Fattening period	78.6±11.7	77.1±10.9	77.3±8.0	75.5±12.2	77.2±17.5
Feed intake	196.0±29.9	201.9±31.1	198.0±33.6	209.3±35.8	198.1±41.7
FCR (kg/kg)	2.74±0.42	2.84±0.50	2.79±0.52	2.88±0.52	2.76±0.61
Slaughter value	77.1±6.1	77.1±6.6	75.9±6.2	77.6±6.3	76.2±7.0
Meat content	58.2±2.1	58.5±1.9	59.3±1.8	58.9±1.9	59.2±2.3

The most important difference – growth

Why hybrid rye is more effective?



Growth rate

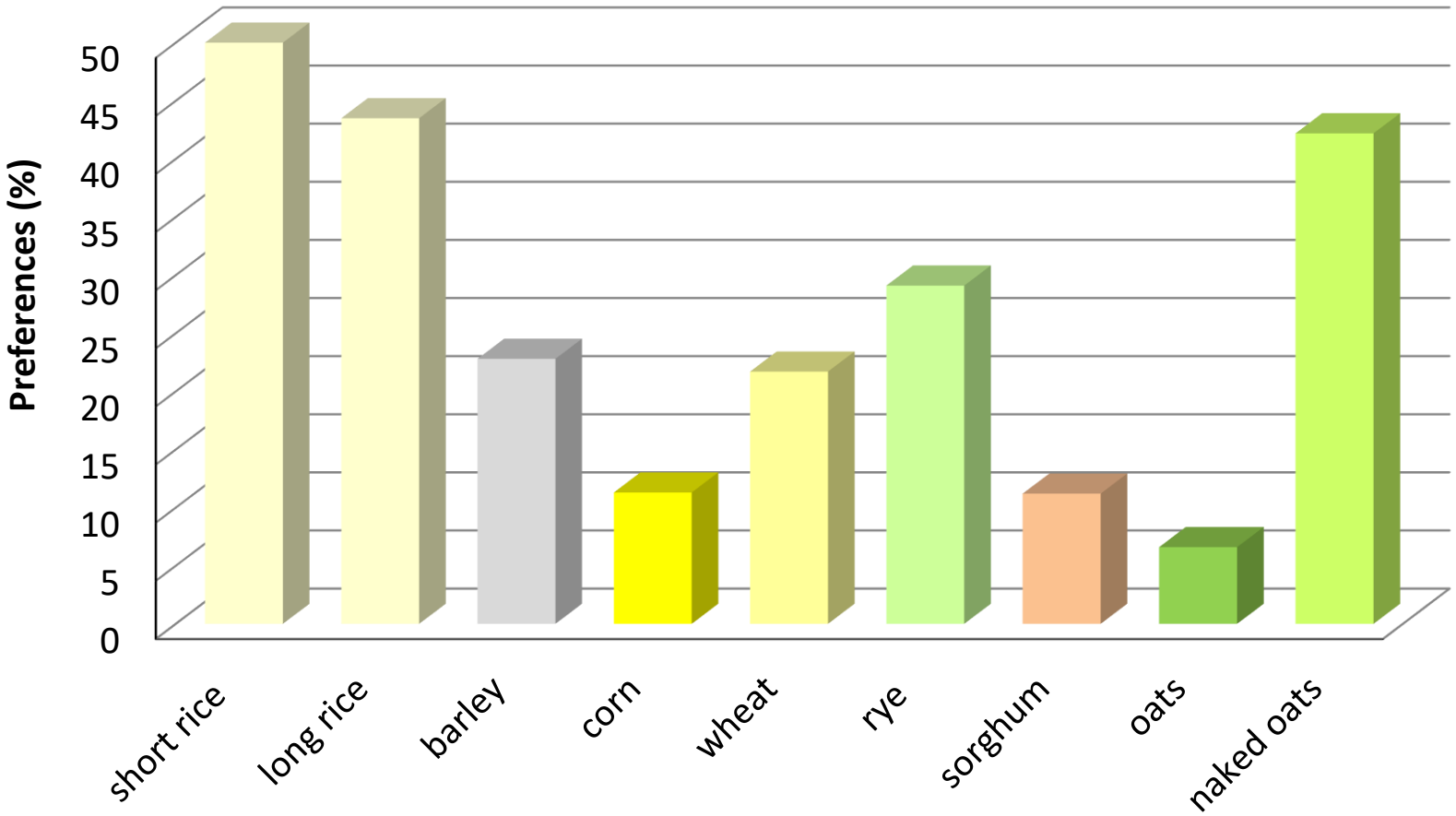
↑

Feed intake

↑

Taste of diet

Is rye more tasty than other cereals?



Sola-Oriol et al. 2014

1. **Probable reasons of taste preferences to rye are:**
   a. **increased simple sugars content**
   b. **improved sugar/phenol+tanin index**
   c. **less risk of micotoxin contamination**

2. **Hybrid rye seems to be preferred in comparison to population rye because of:**
   a. **improved sugar/phenol+tanin index**
   b. **lower grain extract viscosity**

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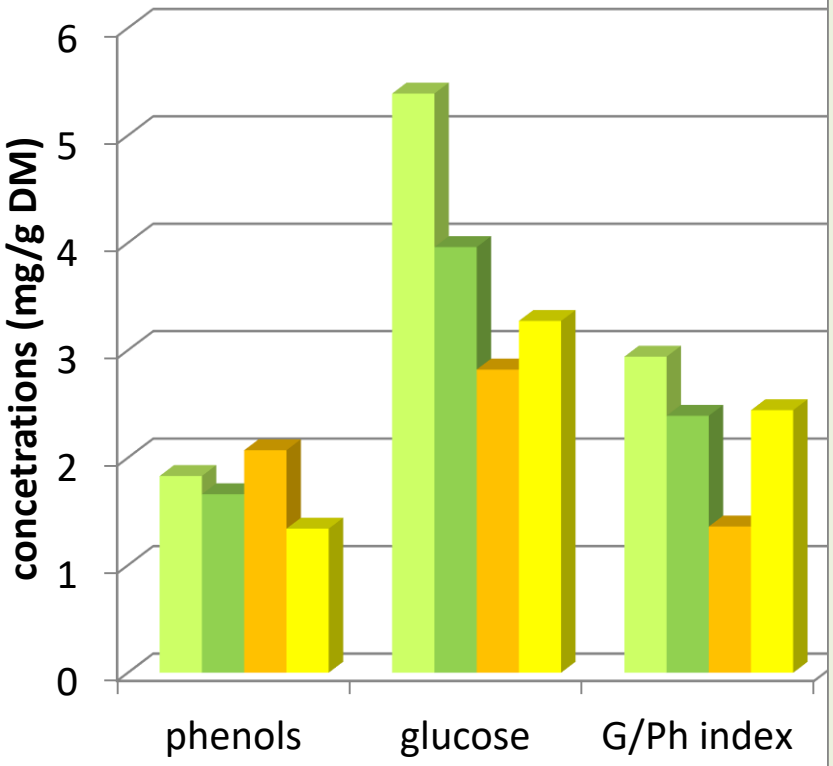
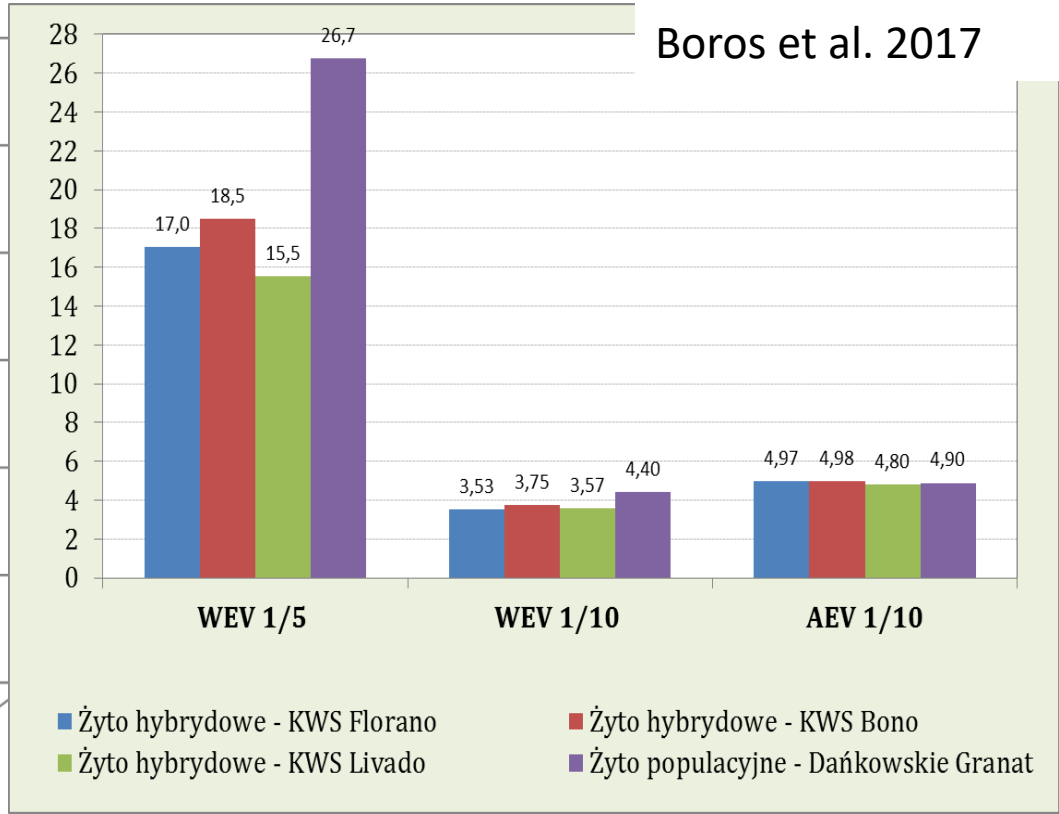
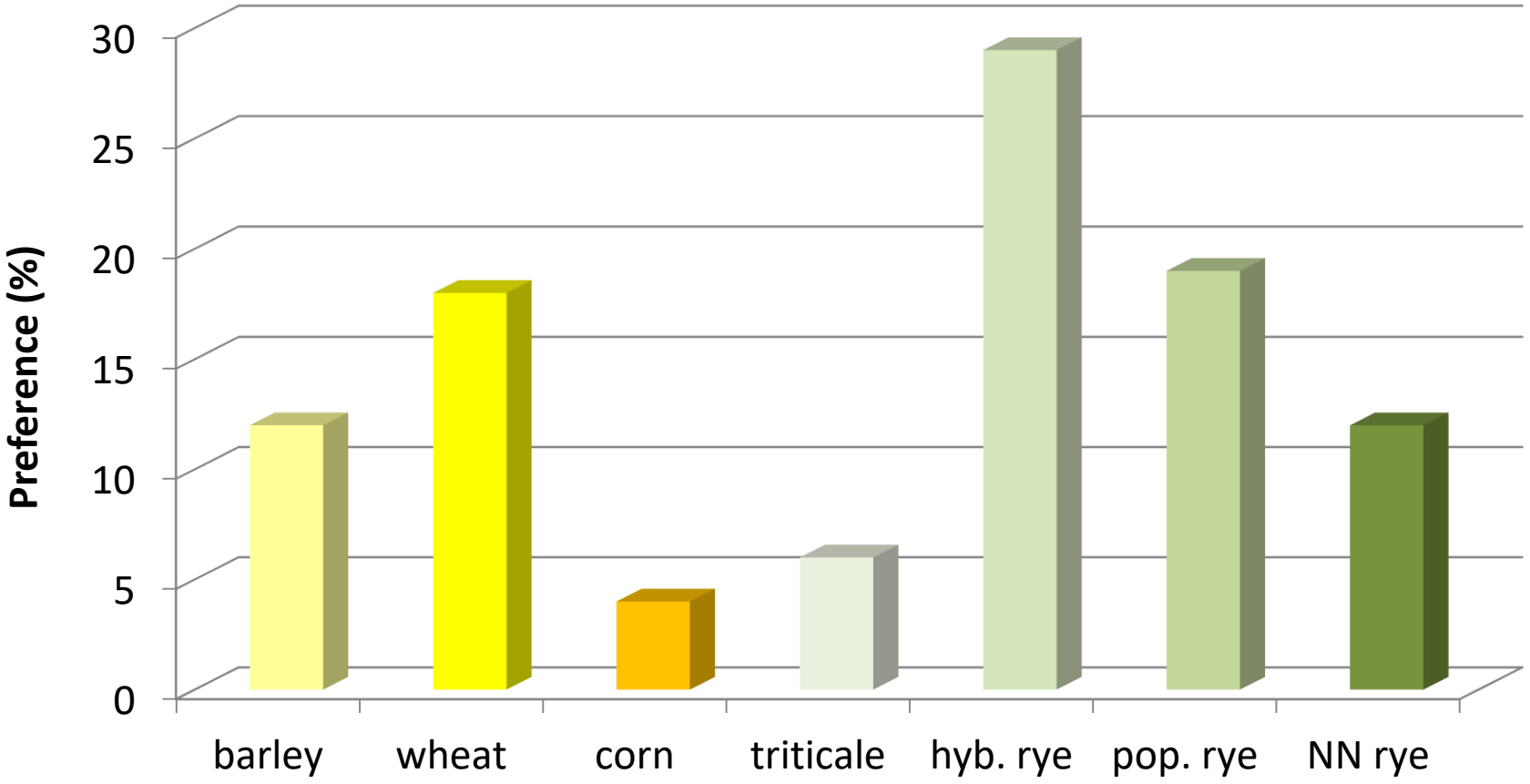


Boros et al. 2017



Preferences of pigs to cereal components of diets



Pabiańczyk et al. 2019

Conclusions

- No significant differences were noticed among control and experimental groups in any of analyzed parameters.
- The use of high content of hybrid rye in the diet increased daily gains in the level that could be relevant for commercial production.
- The effectiveness of hybrid rye usage as feedstuff probably comes from better taste and lower viscosity of diets .

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Final conclusion

Taking into account no differences in pig performance both, hybrid and population rye seem to be good alternative for standard cereal grains used as energy source in swine nutrition.

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