JUSTUS-LIEBIG-UNIVERSITÄT GIESSEN

Performance and carcass quality of genetically different pigs under conventional and organic production

Werner, D.[1], Brade, W.[2], Weißmann, F.[3], Brandt, H.[1]

[1]Institut für Tierzucht und Haustiergenetik, Ludwigstraße 21b, 35390 Gießen
[2]Landwirtschaftskammer Niedersachsen, Johannsenstraße 10, 30159 Hannover
[3]Bundesforschungsanstalt für Landwirtschaft, Außenstelle Trenthorst, 23847 Westerau

Question of interest

- **Are different pig breeds equally adequate for conventional and for organic environments?**
- **Are there Genotype ✸ Environment interactions and which are necessary ramifications?**
- **Does organic environment require own breeding programs for pigs?**

Financial support was given by the German Federal Organic Farming Scheme

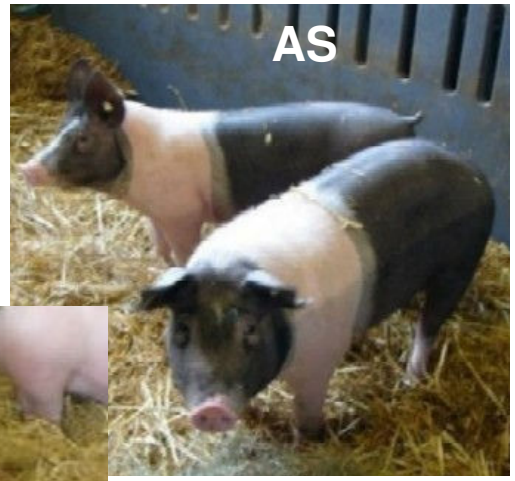
Breeds

Schwäbisch Hällisches

Comercial crossbred

Pietrain x Schwäbisch Hällisches

Pietrain x Edelschwein



Angler Sattelschwein

Pietrain x Angler Sattel.

Duroc x Landrace

Number of animals

Total after 3 rounds each station

Station	Breed	Conventional	Organic	Total
Neu Ulrichstein	BHZP	31	30	61
	SH	30	29	59
	PIxSH	29	29	58
Rohrsen	BHZP	60	36	96
	AS	58	32	90
	PIxAS	62	36	98
	PIxDE	67	44	111
	DUxDL	65	44	109
Total		402	280	682

38 losses during fattening period → 5.6 %

Means and standard deviations

Trait		Conventional (n = 378)	Organic (n = 257)
Daily gain	(g)	875 ± 118	766 ± 108
Feed conversion	(kg/kg)	2.65 ± 0.27 (n = 172 groups)	3.22 ± 0.29 (n = 65 groups)
Meat percentage	(%)	56.2 ± 4.3	55.6 ± 4.1
Meat-Fat-Ratio	(1:)	0.44 ± 0.22	0.49 ± 0.20
Intramuscular fat	(%)	1.4 ± 0.7 (n = 276)	2.8 ± 1.2 (n = 168)

Statistical Analysis

Fixed effects in the model

- Breed (7 breeds)
- Environment (organic, conventional)
- Sex (castrate, gilt)
- Interaction Breed*Environment

Addtional covariates:

for daily gain and feed conversion: weight at start of fattening

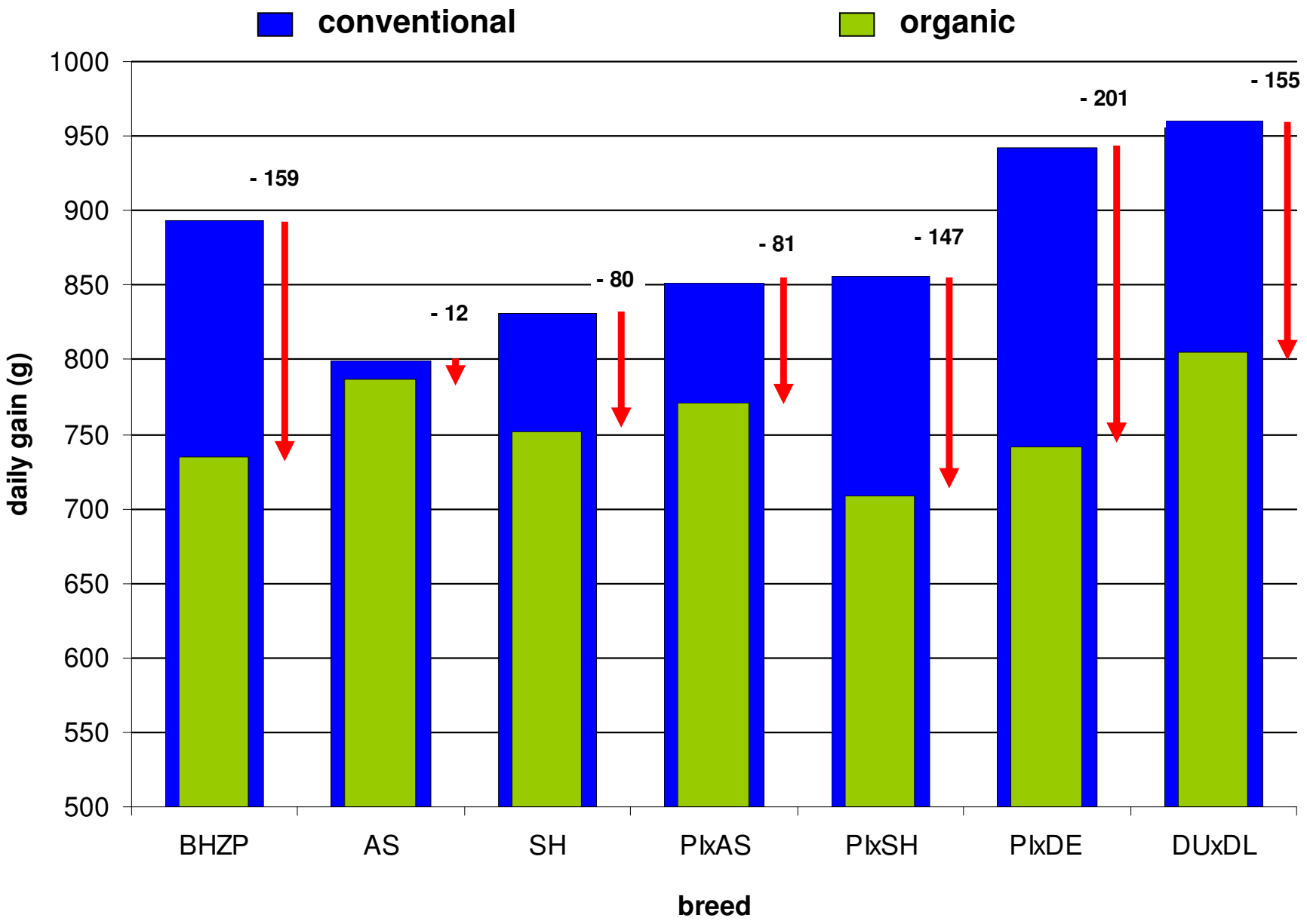
for carcase traits: weight at slaughter

Significance level for effects

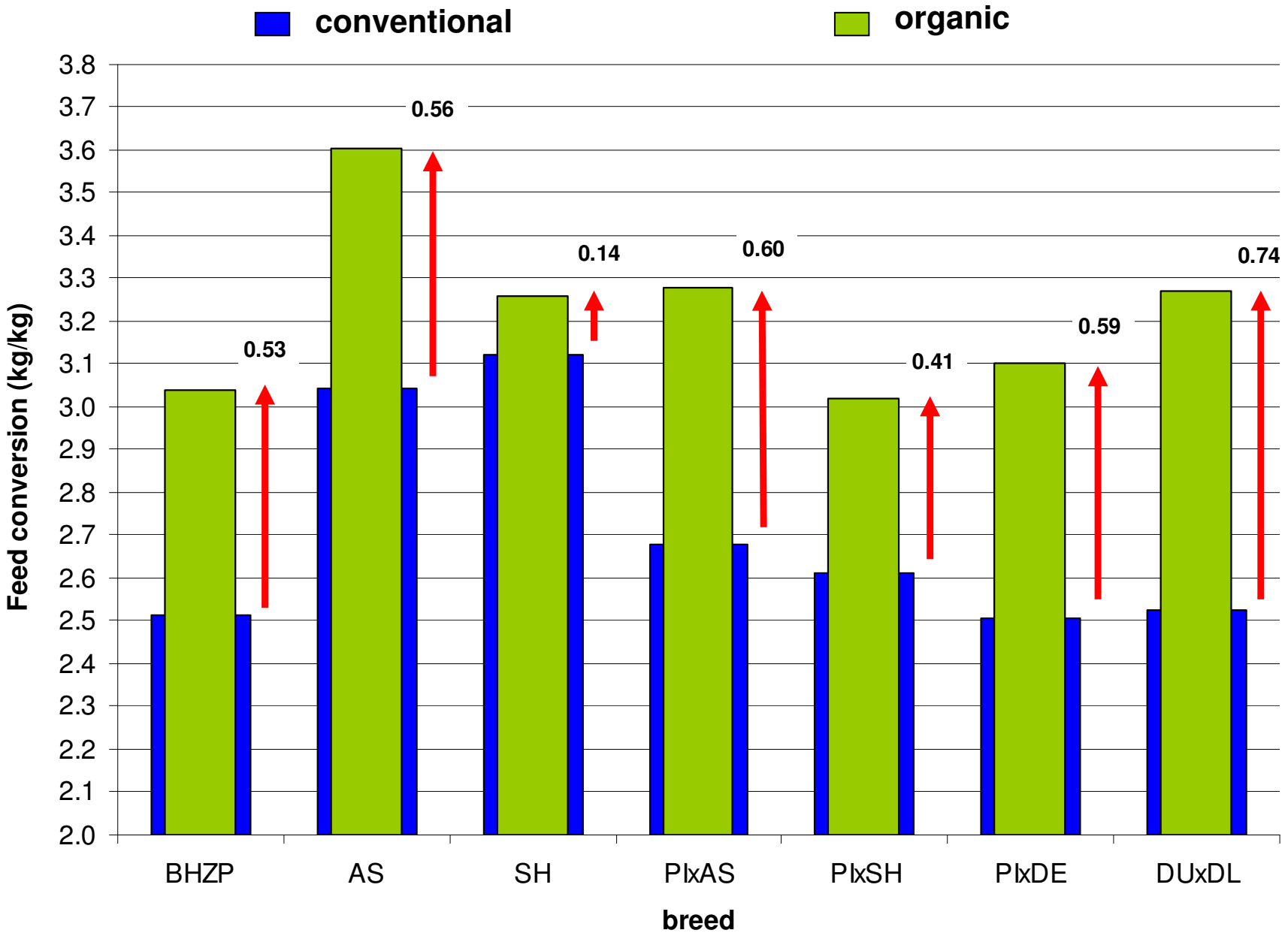
	Daily gain	Feed conversion	Meat content	Meat-Fat-Ratio	Intramuscular fat
Breed	***	***	***	***	***
Environment	***	***	**	***	***
Sex	***	***	***	***	***
Breed * Environment	***	***	***	***	***
Weight	***	***	***	**n.s.**	***

n.s.: non significant, ***:** $p < 0.05$, ****:** $p < 0.01$, *****:** $p < 0.001$

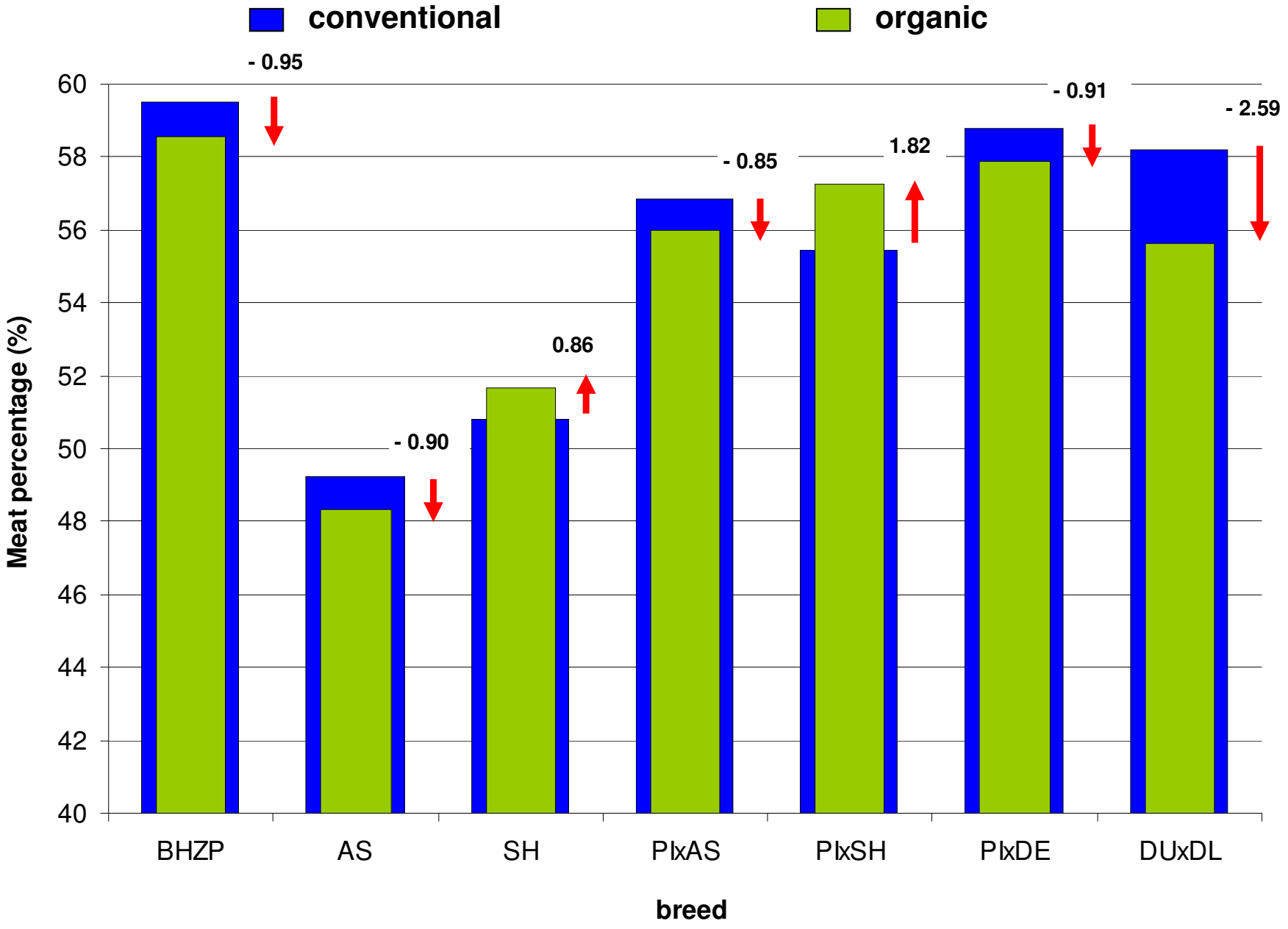
LS-means – daily gain



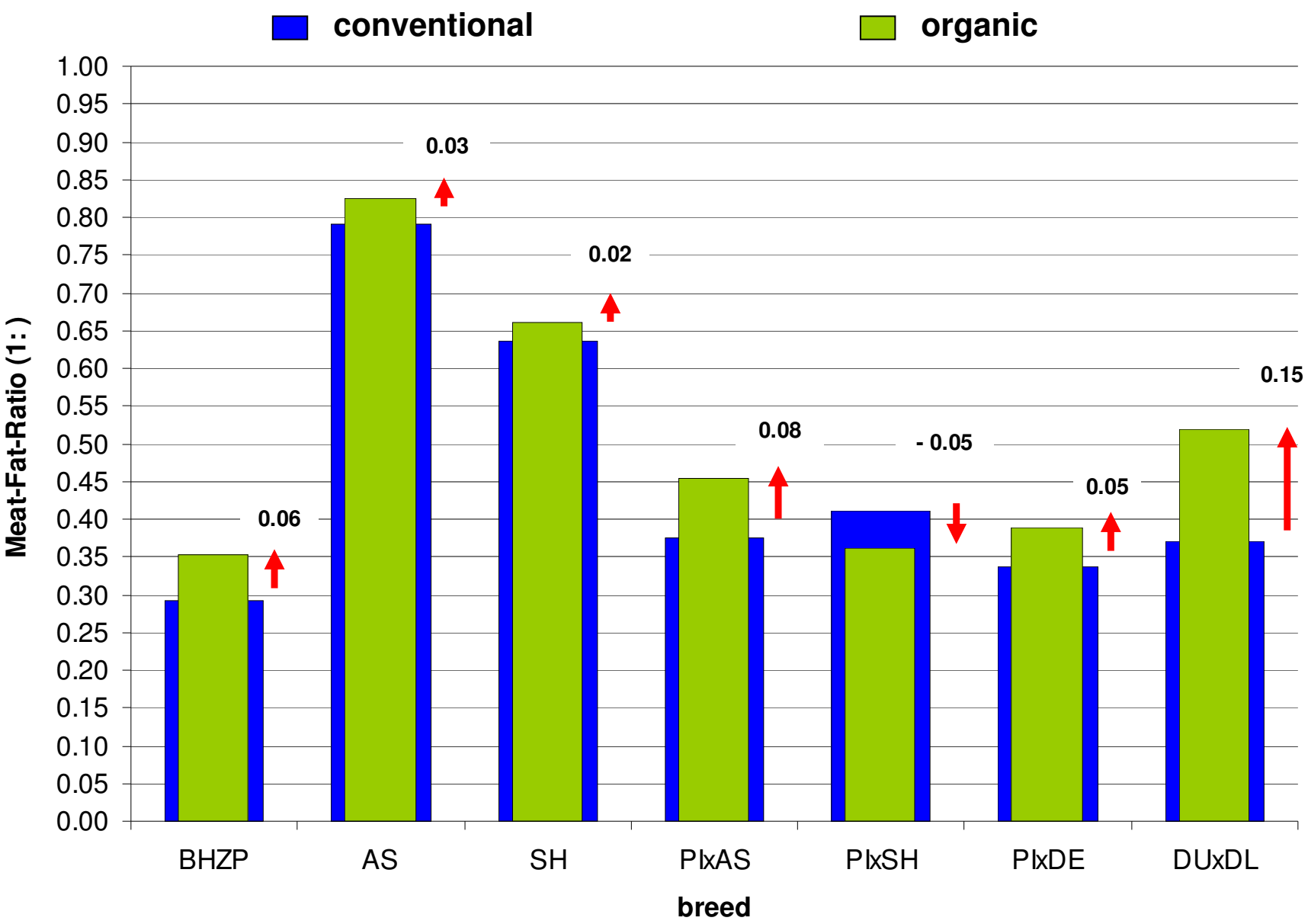
LS-means – Feed conversion



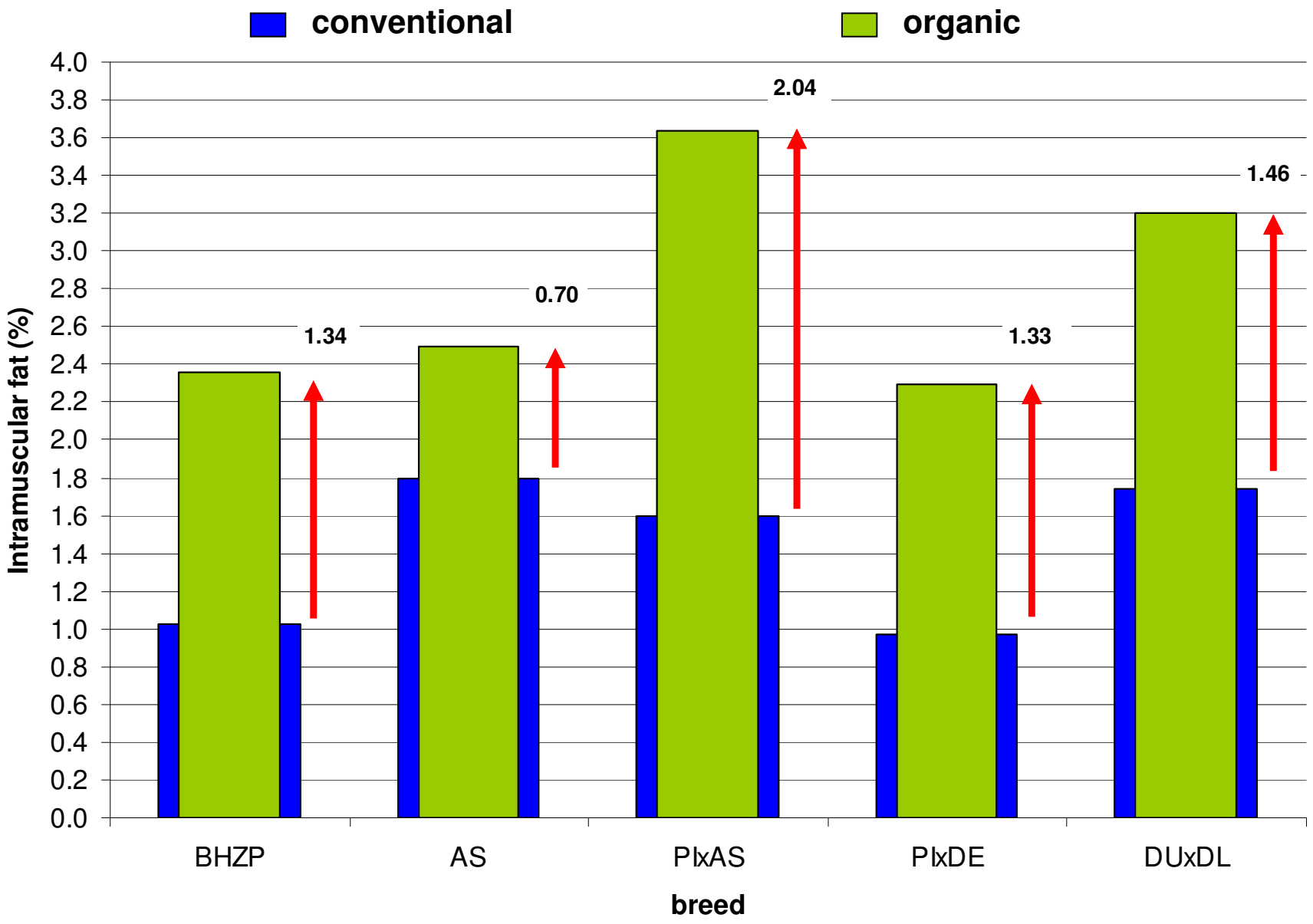
LS-means - Meat percentage



LS-means – Meat-Fat-Ratio



LS-means – Intramuscular fat



Conclusions

- **Statistically significant Genotype ✸ Environment interactions exist.**
- **These interactions can be explained by varying differences between conventional and organic environments within breeds.**
- **There are no relevant differences in ranking between breeds within environments.**
- **Superior breeds under conventional environments are also superior under organic production conditions.**
- **No own breeding program for organic production is necessary.**