Breeding replacement gilts for organic pig farms

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Content

- Problem description
- Objective
- Survey organic *vs* conventional farms
- Simulation studies
- Summary
- Discussion
- Conclusions

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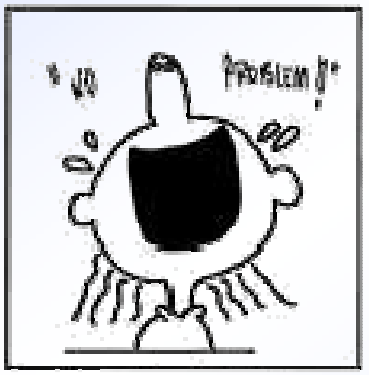
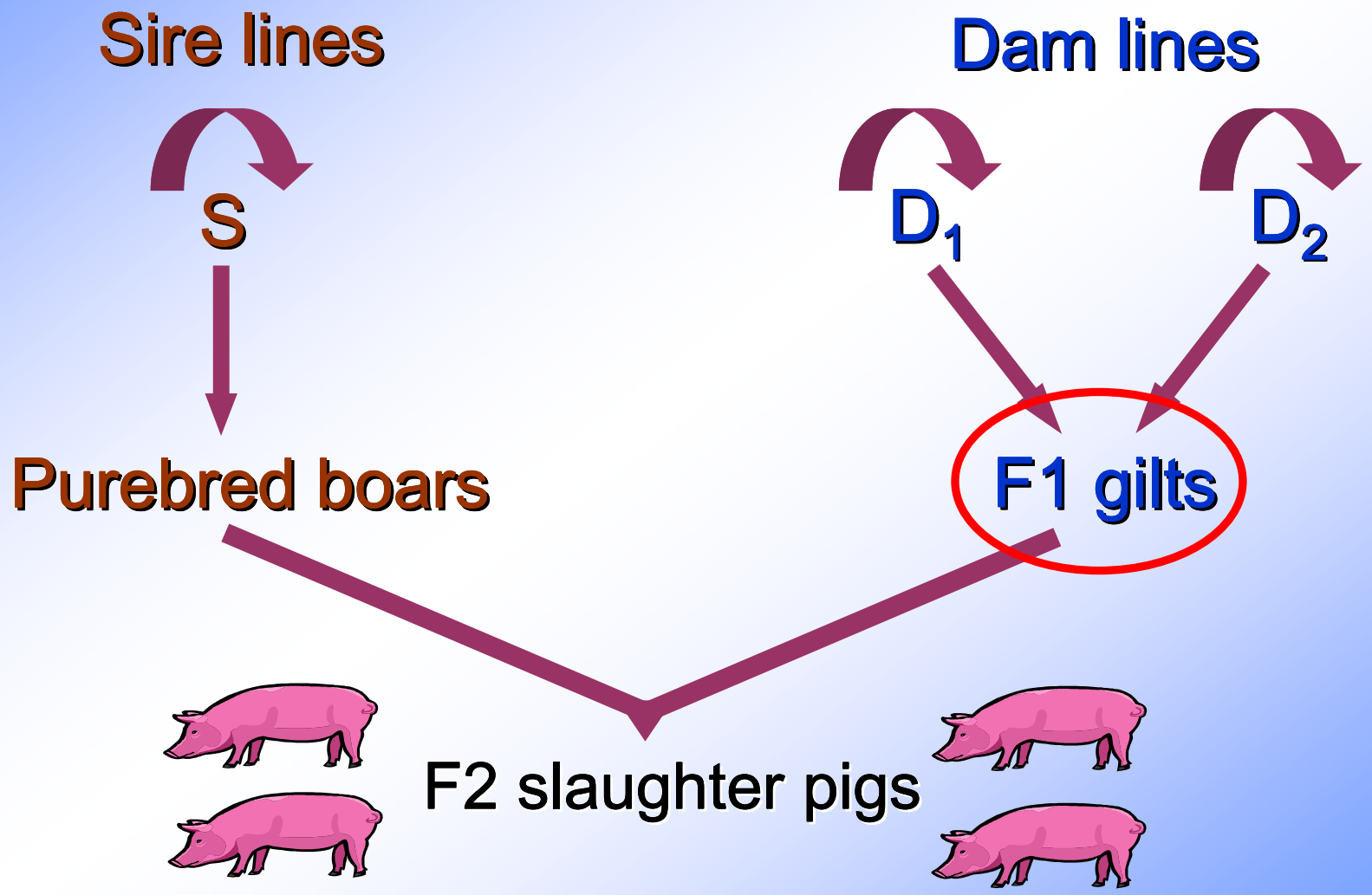


General structure of pig breeding



Dutch organic pig farmers

- Purchase gilts from conventional multiplying farms
- Breed their own F1 gilts

BUT:

- European organic standards prohibit >20% purchase of conventional replacement gilts
- Small size of many organic farms limits own replacement breeding

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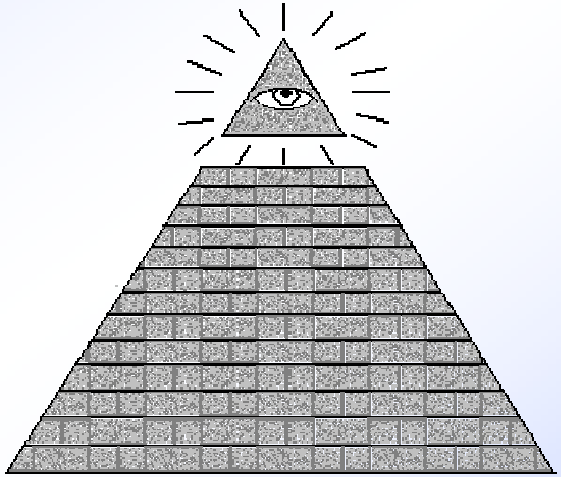
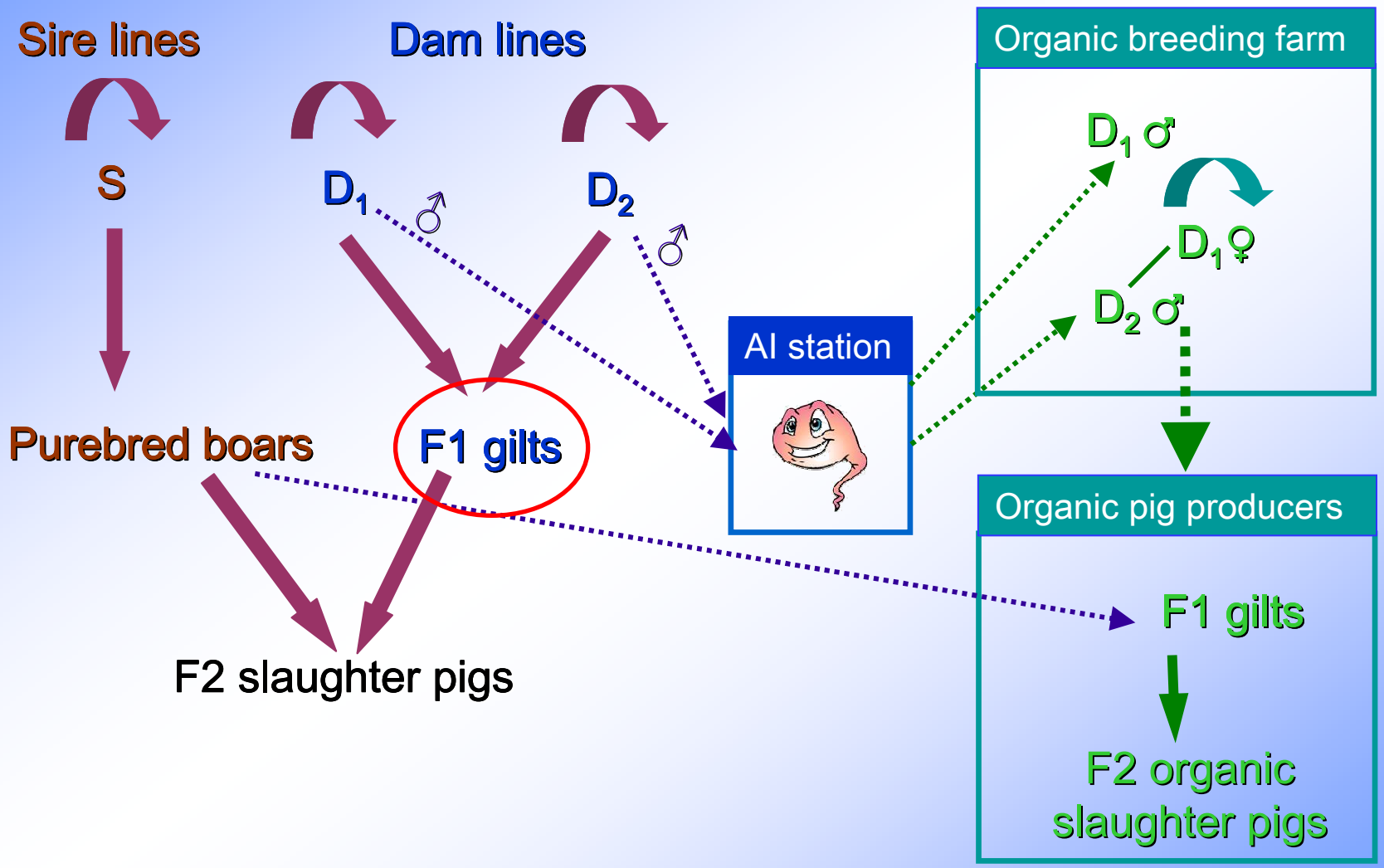
Identify suitable breeding structures and breeds that provide the Dutch organic pig industry with replacement gilts

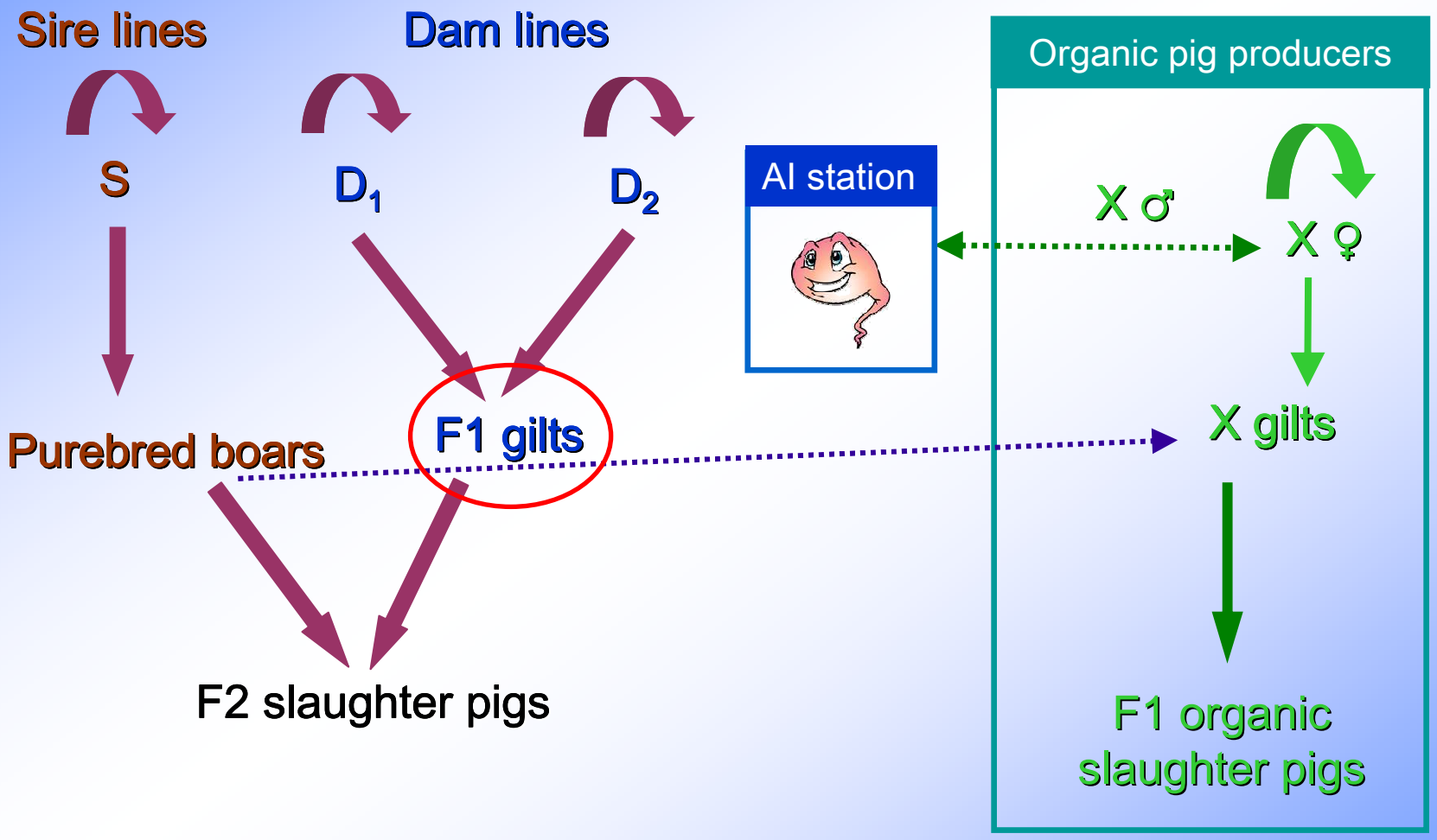
Possible breeding structures



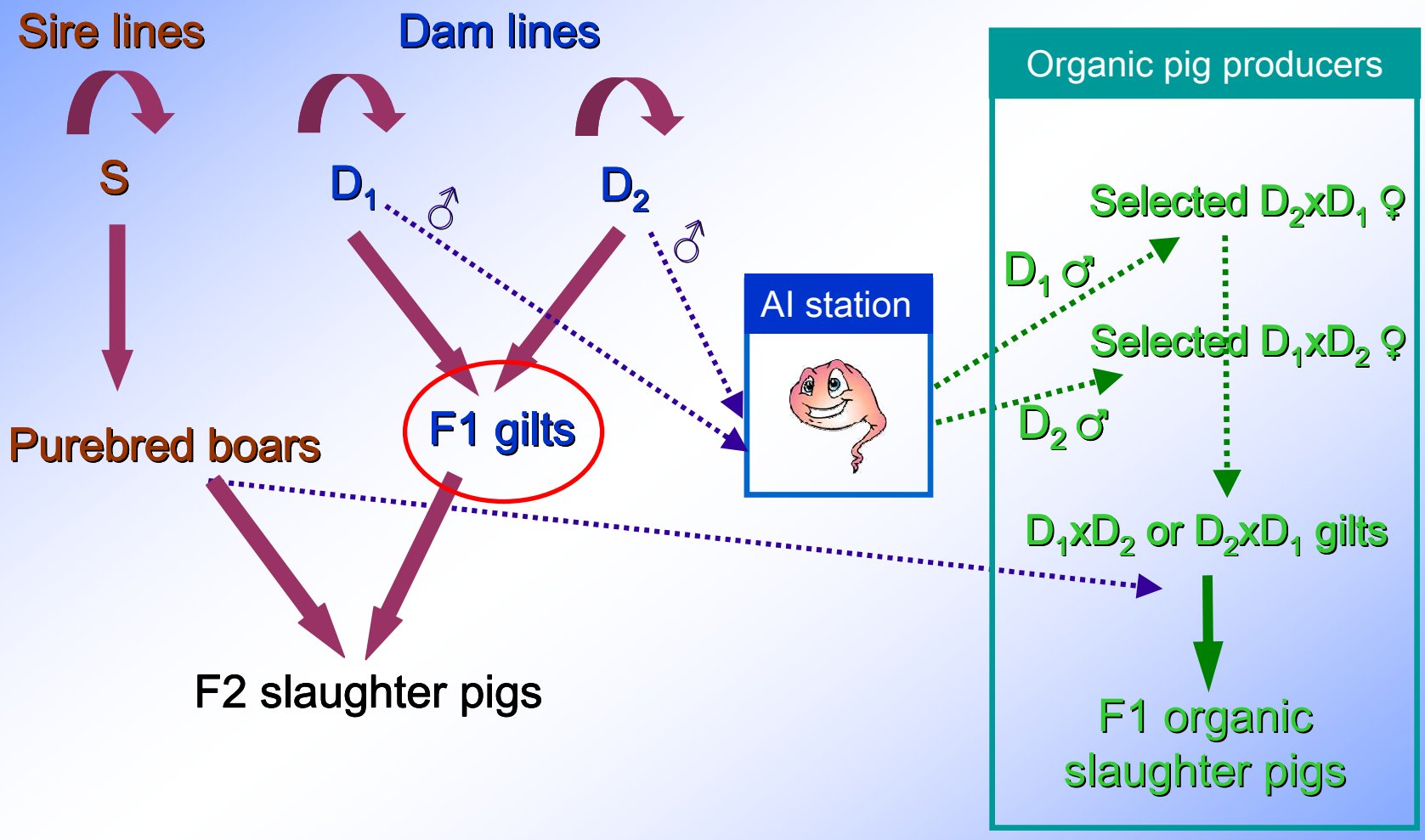
Option 1: Organic breeding farm



Option 2: Flower breeding system

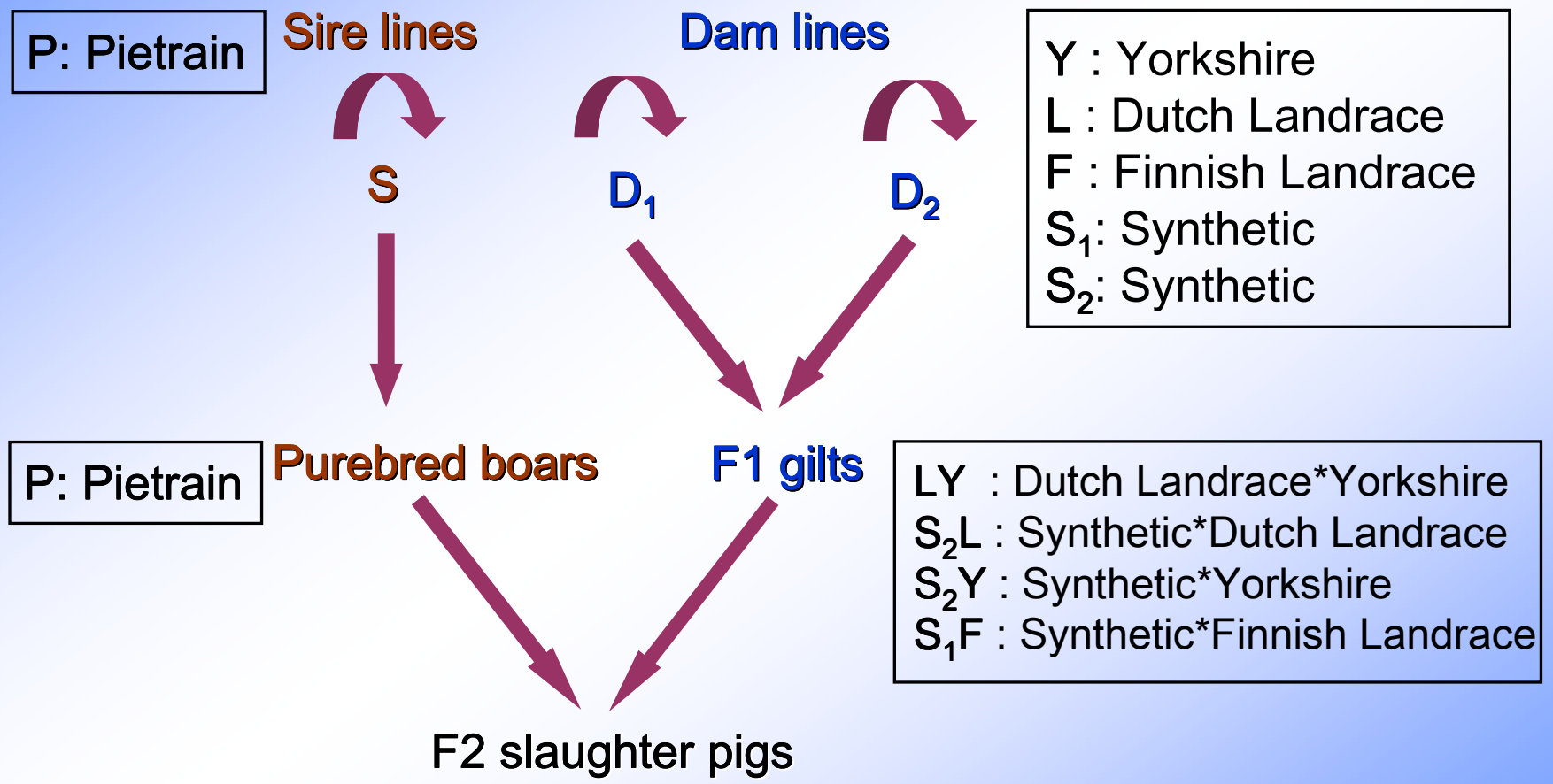


Option 3: Two-breed rotational cross



Possible breeds

TOPIGS breeds



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Survey organic *vs* conventional farms

⇩

Reproduction performance organic *vs* conventional

⇩

Simulation studies

- Performance of TOPIGS pure lines under organic conditions
- Economic model analysis
- Prediction of selection response

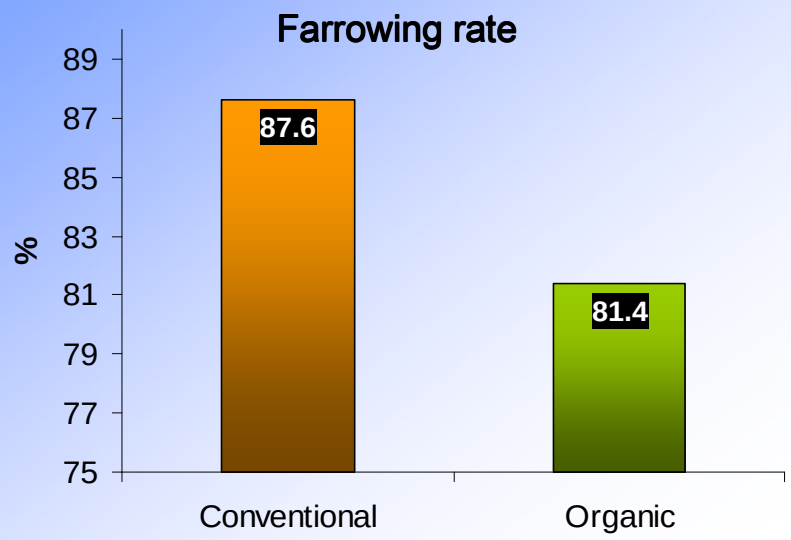
⇩

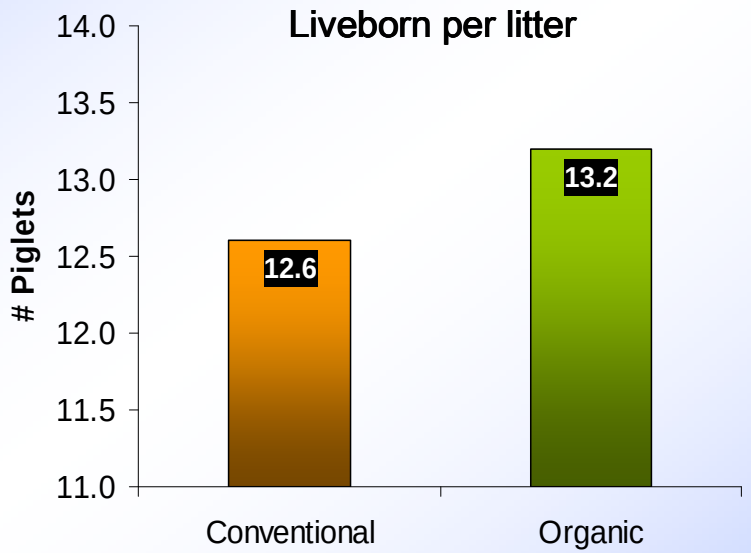
Most suitable breeding structure and breed to provide organic replacement gilts

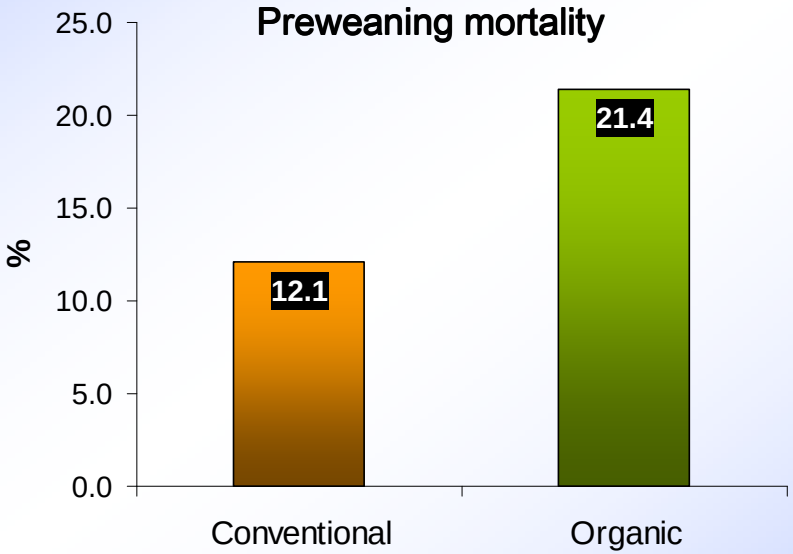
Survey organic *vs* conventional farms

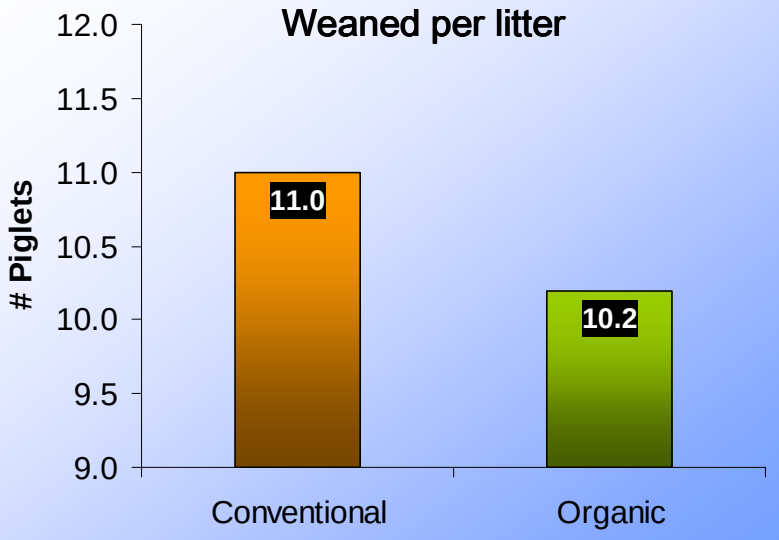
- Reproduction performance
- 15 Organic farms (2000 sows total)
- 600 Conventional farms (240.000 sows total)
- Commercial pig farms
- The Netherlands
- TOPIGS genetics
- 2006-2007

Results survey









Reproduction performance organic *vs* conventional

- Farrowing rate: 6% lower
- Liveborn/litter: 0.6 piglet higher
- Preweaning mortality: 9% higher
- Weaned/litter: 0.8 piglet lower

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Simulation studies

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- Economic model analysis
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TOPIGS pure lines under organic conditions

- No performance results available of pure lines on organic farms

- These results are needed for economic model analysis

- Performance results of pure lines on conventional farms are available

- Simulated performance =
Results conventional purebred + (organic-conventional performance)

Simulated performance TOPIGS pure lines under organic conditions

	Purebred dam line				
	Y	L	F	S_1	S_2
Liveborn per litter (#)	13.2	12.5	12.6	11.4	12.0
Stillborn per litter (#)	1.1	0.8	0.7	0.8	0.9
Preweaning mortality (%)	23.0	19.8	19.4	17.1	22.1
Weaned per litter (#)	10.1	10.0	10.1	9.4	9.4
Farm litter index	2.09	2.06	2.05	2.12	2.08
Weaned per sow per year (#)	21.2	20.7	20.7	20.0	19.4

Simulation studies

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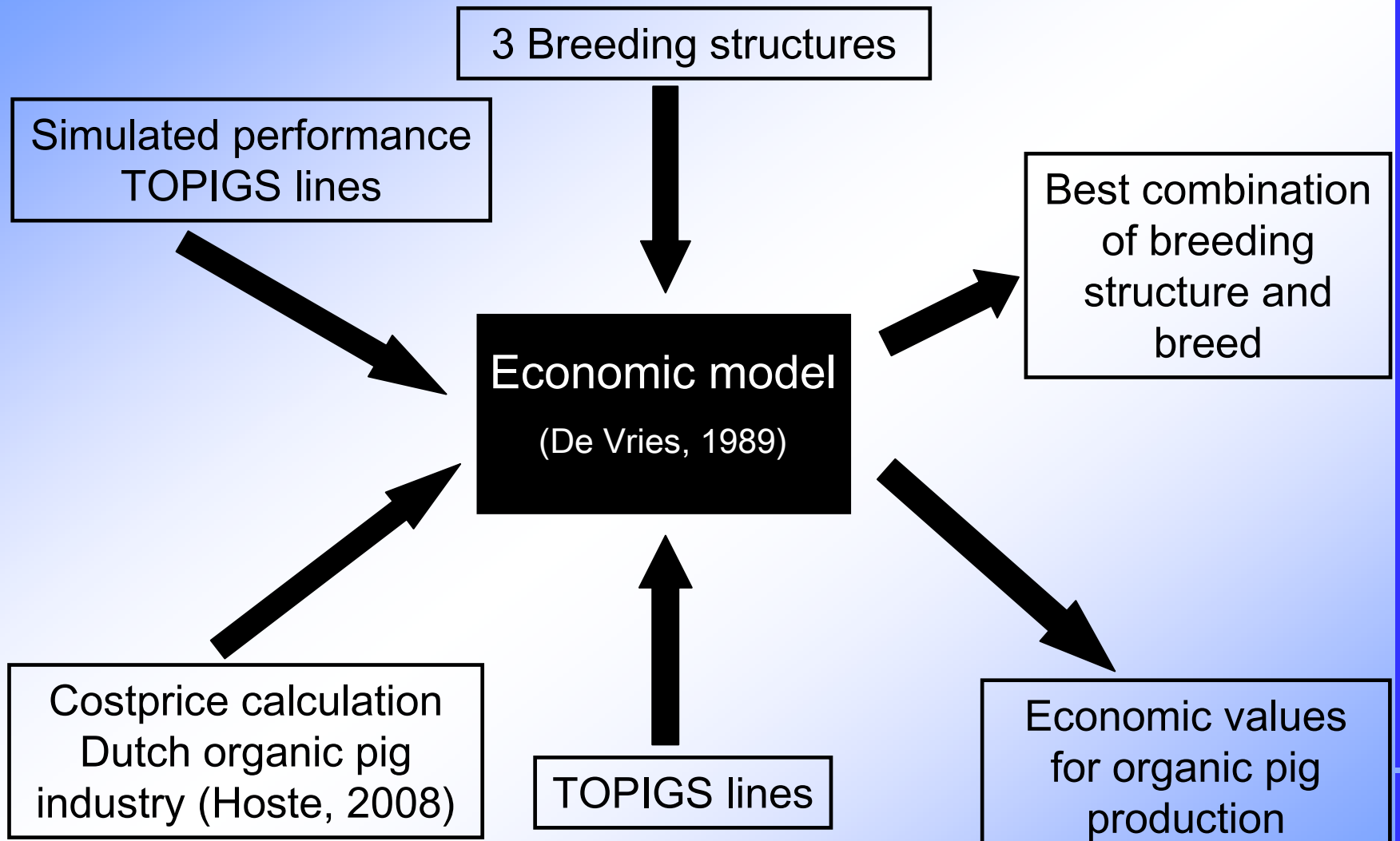
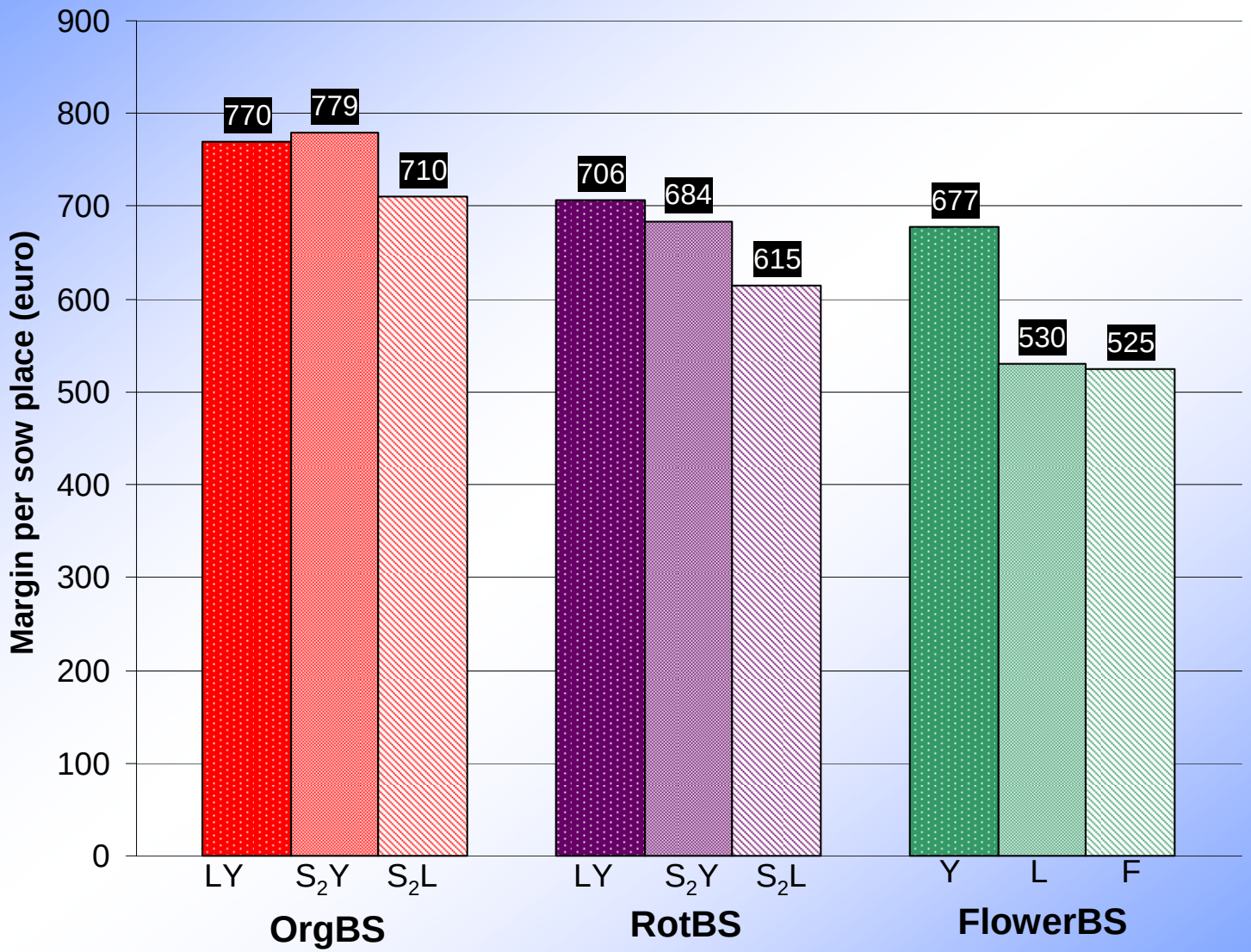
Methodology



Results economic model analysis



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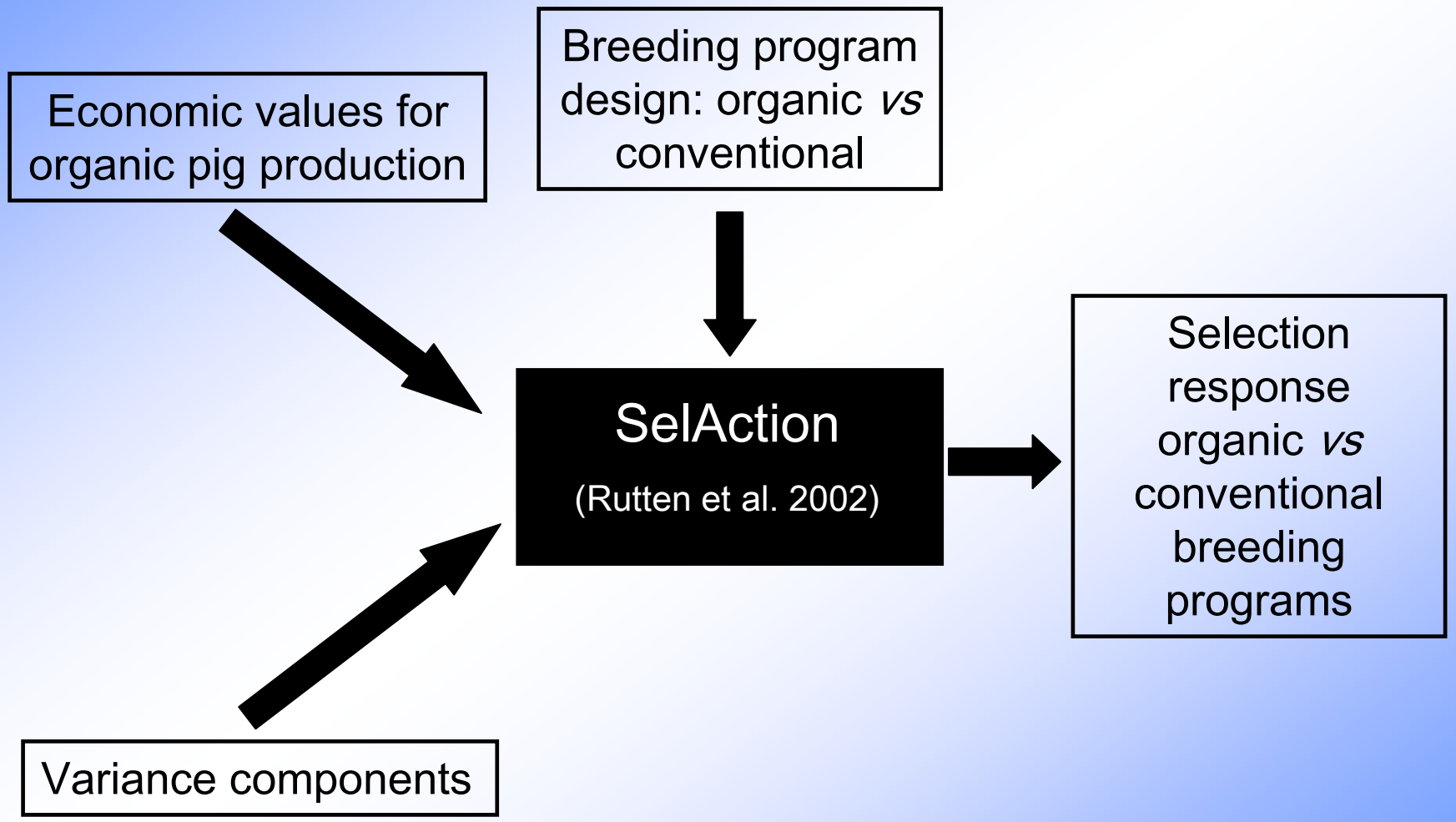
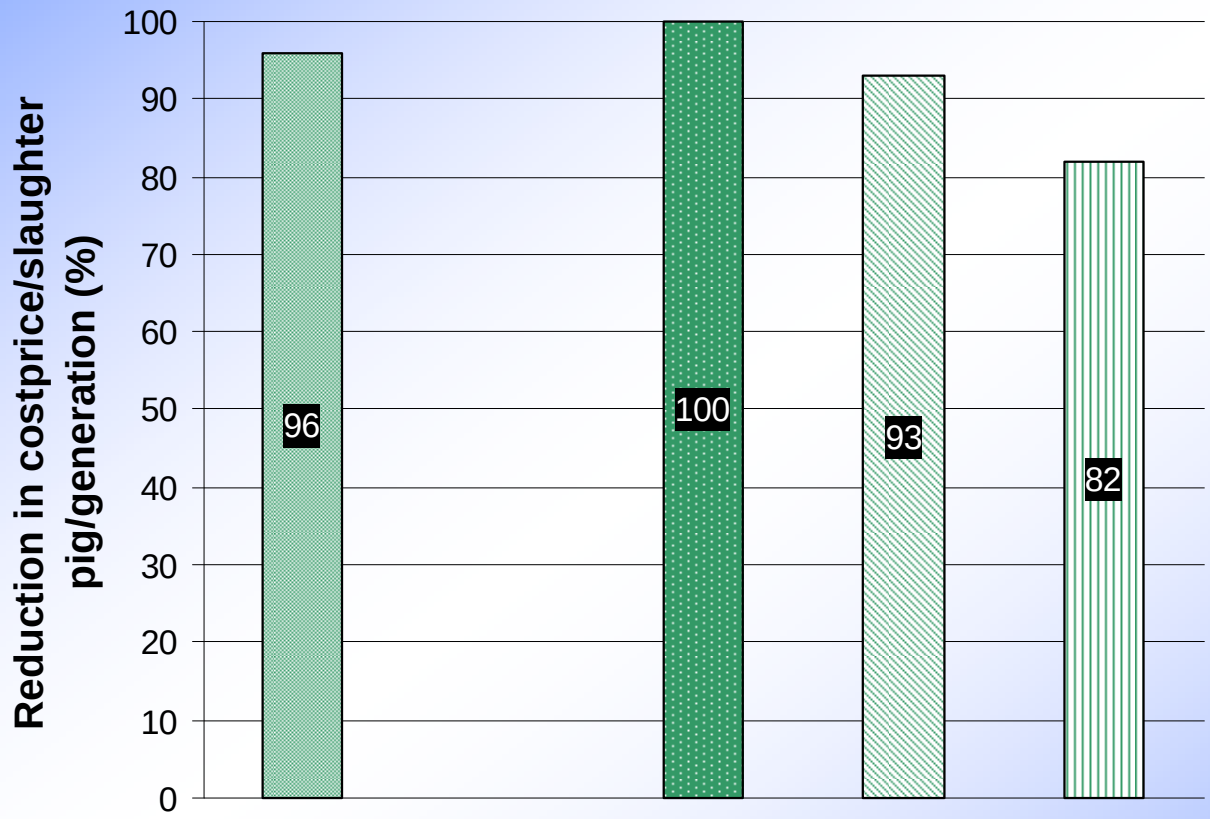


Predicted selection response



Breeding program	Conventional	Organic	Organic	Organic
Breeding structure	OrgBS & RotBS	FlowerBS	FlowerBS	FlowerBS
Data collection	Full	Full	Limited	Full
Population size	5000	5000	5000	2000

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Summary

- Organic breeding farm with Yorkshire/synthetic cross is currently the most profitable option

- Two-breed rotation system with Landrace/Yorkshire breeds is the second best option

- Flower breeding systems with optimal design achieve the highest genetic progress

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Discussion (1)

- Organic breeding farm is risky in case of disease outbreaks or economic recession
- Flower breeding system is only feasible with optimal design of the breeding program
- Two-breed rotation system is a closed structure, encompassing selection under organic conditions

Discussion (2)

- Two-breed rotation system can be a startup for a future flower breeding system with a specific organic line
- Suitability of other breeds needs to be investigated
- EU collaborative project '**Low Input Breeds**'

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Conclusions

- Organic breeding farm is economically the most favourable structure, but is sensitive to disease outbreaks

- Flower breeding system is not yet feasible for the Dutch organic pig industry

- Two-breed rotation system is currently the best option to provide replacement gilts for the Dutch organic pig industry

Acknowledgements

- Dutch organic pig farmers
- TOPIGS
- De Groene Weg
- Animal Sciences Group (Wageningen University)

TOPIGS

De Groene Weg

ANIMAL SCIENCES GROUP
WAGENINGEN UR

IPG


"That's all Folks!"
ACME ACRES
USA
U.S. MAIL
USA
33
2001