Poultry production: Using dual-purpose genotypes to reduce the culling of day-old male chicks?

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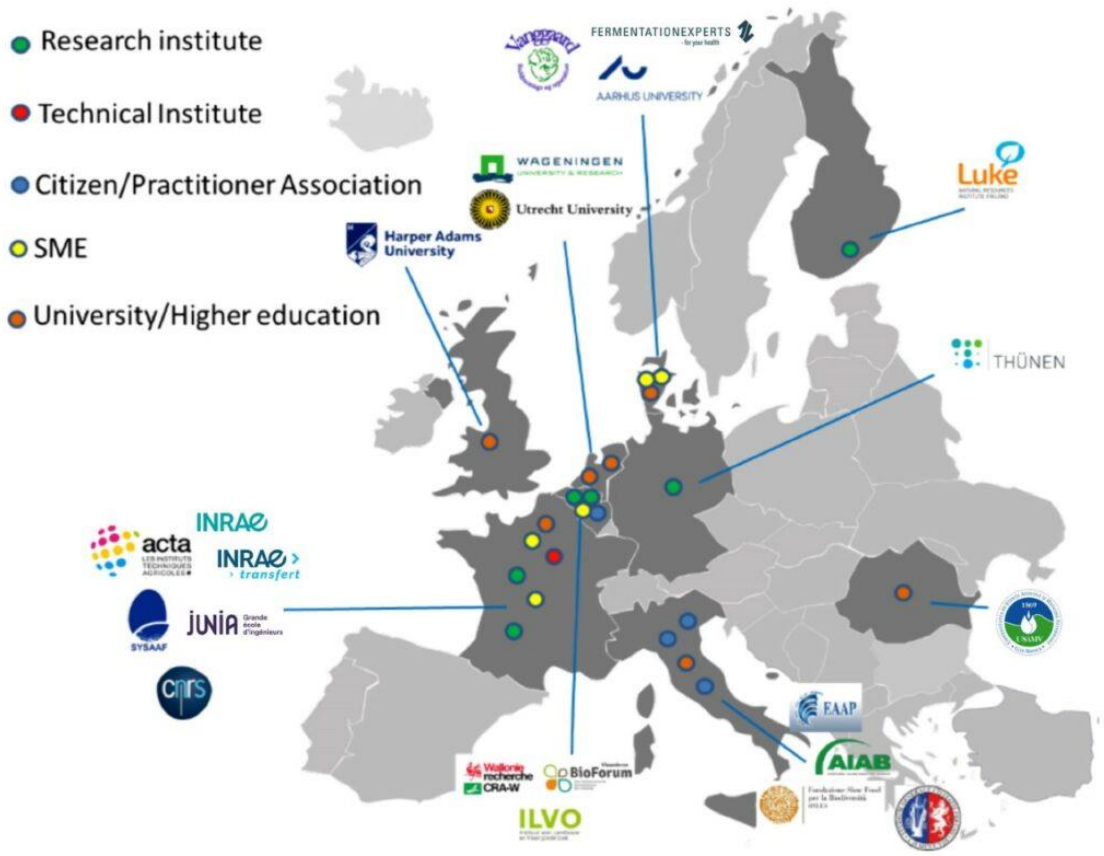
PPILOW – Introduction

- An ethical rather than an animal welfare issue: one day old male chicks of egg laying breeds are typically killed as they are not needed in egg producton.
- Increasing societal pressures towards poultry production to develop higher animal welfare and ethical standards
- Some countries in the EU have already banned the killing of one day old male chicks.
- Poultry production is highly cost and price-driven and costs incurred from adopting welfare practices are therefore of great importance. These costs need to be compensated by identifying new market opportunities.
- How much value dual-purpose genotypes can add and how economic it is?
- The aim of this presentation is to examine the potential of dual-purpose poultry breeds (and in-ovo sexing) from the business case perspective, including both supply and demand potential

PPILOW – Methods I: Consumer survey

- A quantitative survey instrument was developed and implemented in nine European countries (Finland, UK, France, Denmark, the Netherlands, Belgium, Germany, Italy, Romania) in February 2021.
- Altogether 3601 responses
- The sample was representative of each country's adult population (18-70 yr), gender, income distribution and geographical distribution of respondents within each country
- Themes of the survey were Consumption, Purchase, Farming methods and welfare, Welfare and the purchase decision + Background information
- Statistical analyses ➔ Factor analysis & ANOVA



PPILOW – Methods II: Value-adding potential & supply side survey

- An online survey targeting farmers and poultry and pig supply chain experts was developed and distributed to test the implement ability of practices under different contexts among stakeholders in June-July 2021.
- The survey was distributed to the target group electronically by email, newsletters and other electronic channels.
- The data included altogether close to 250 responses, including responses from both poultry and pig production experts.
- Financial and productivity implications of dual-purpose breeds were examined through already existing information (publications etc.). Petra, would you have any input to this matter?
    - Literature review (few publications with economic evaluation; one example: “Lambertz, C, Wuthijaree, K, Gauly, M (2018): Performance, behavior, and health of male broilers and laying hens dual-purpose chicken genotypes”).

PPILOW – Methods III: Business model canvas

Value Proposition

- What do we provide our customers?
- What problem are we solving?

Customer Segments

- Who are the customers ➔ To whom are we creating value?
- Why they are customers (the reasons may vary by segment)?

Channels

- How will we reach customer segments?
- How are our channels integrated?
- Which channels are the most efficient?

Customer Relationships

- What type of relationship does each customer segment want?
- How costly are the relationships?
- How do we integrate them with the rest of our business model?

Key Partnerships

- Who are our key partners and suppliers?
- Which key resources they have?
- What key activities they perform?

Key Activities

- What key activities do our value proposition, channels, customer relationships, and revenue streams require?

Key Resources

- What resources our value proposition, channels, customer relationships, and revenue streams require?

Cost Structure

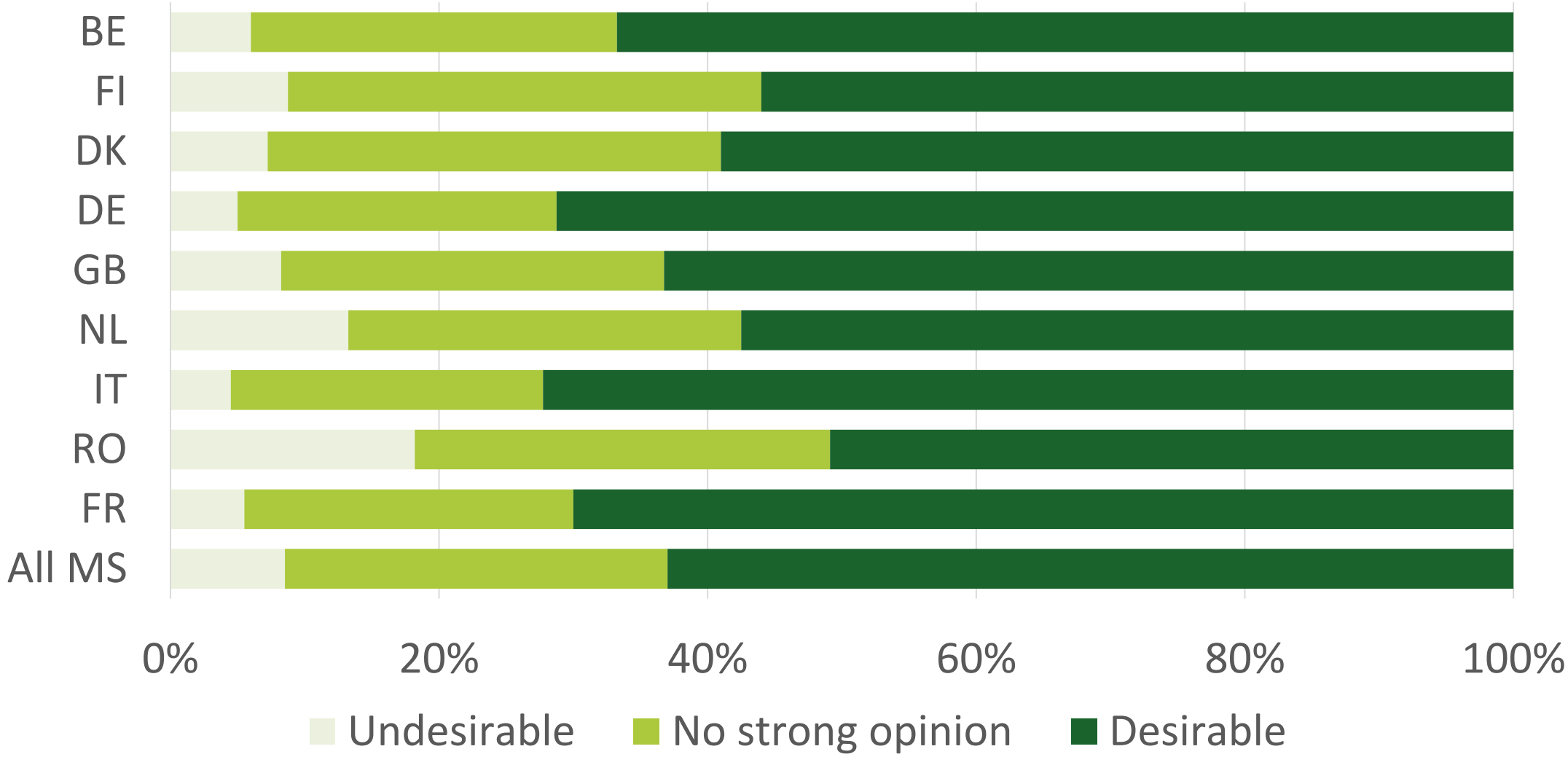
- What are the most important costs in our business model?
- Which activities and resources are the most expensive?

Revenue Streams

- What are customers willing to pay?
- What and how they currently pay?
- How much does each cash flow contribute to overall revenue?
- How we make profit with the proposed model (earning logic)?

The desirability of using methods to avoid the killing of one day old male chicks

In total, 63% of citizens considered methods that avoid the killing of male day-old chicks as desirable methods.



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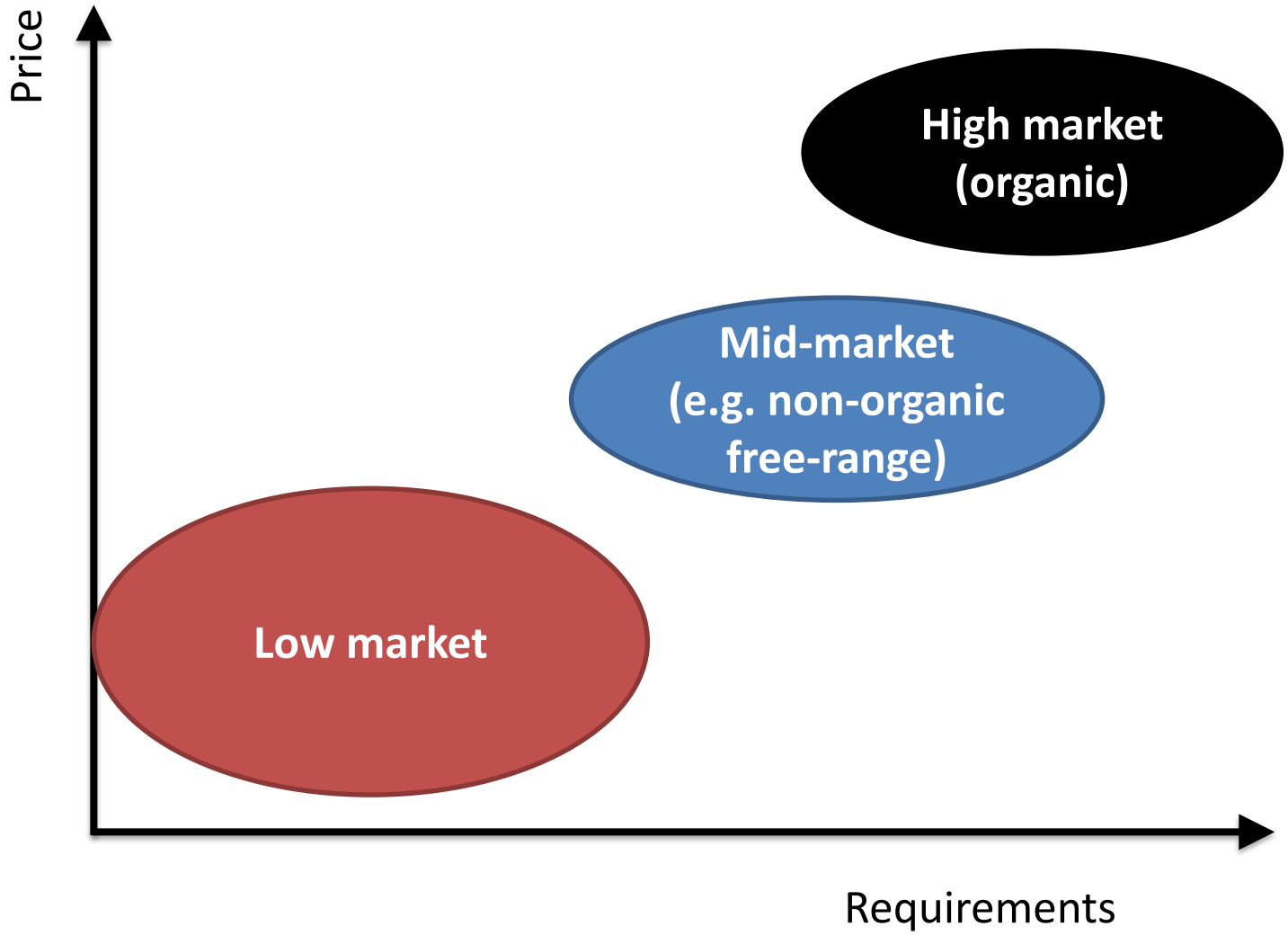
Positioning of the farming system



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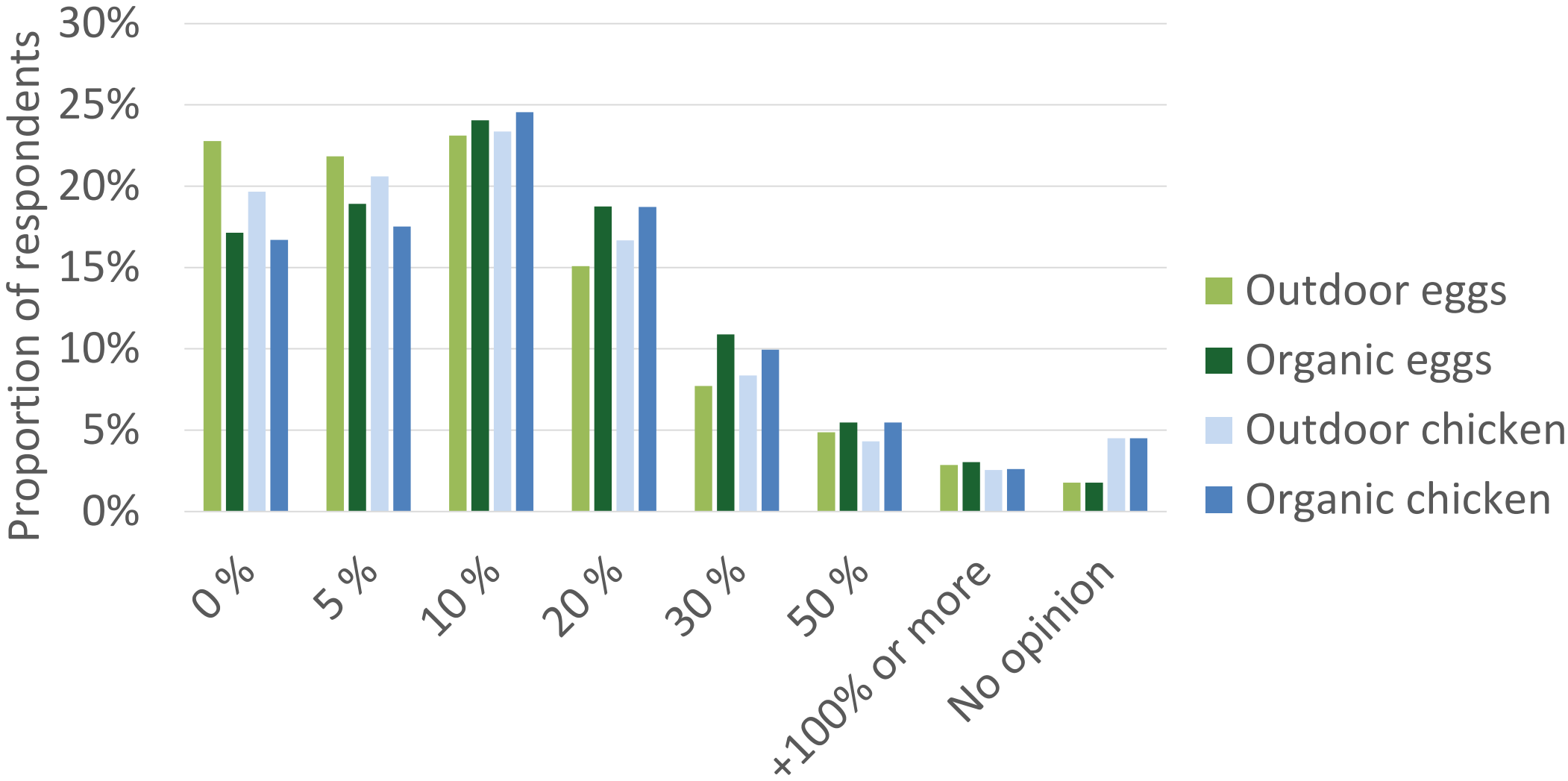
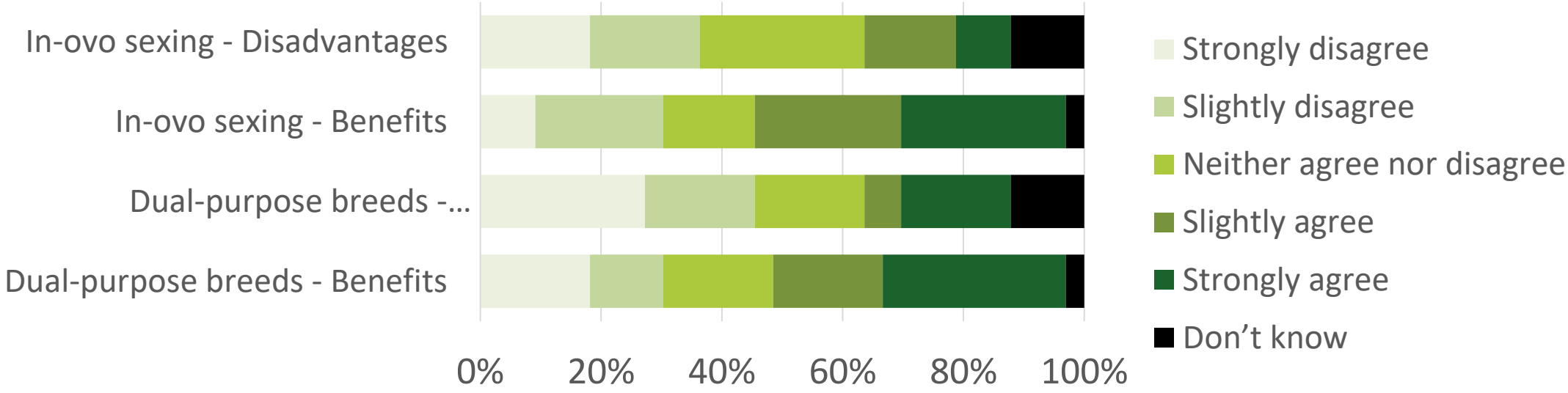
Willingness to price a premium for organic or oudoor production's products

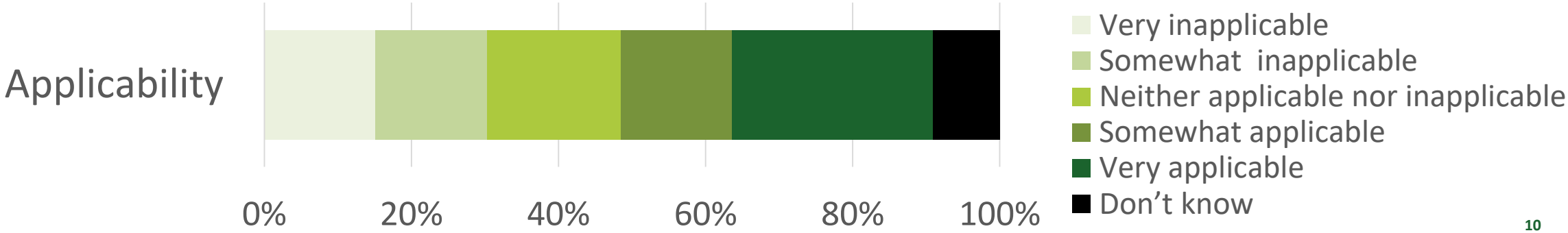
Small differences between member states. Slightly higher WTP in Romania than elsewhere.



PPILOW – Perceived existence of disadvantage that prevent, and benefits that promote the adoption of practices



In total 42% of producers found that methods that avoid the killing of male day-old chicks were applicable.



PPILOW – Results: Economic considerations

- Add here 1-2 slides about the productivity and economic performance of dual purpose breeds
- Although two products are obtained, the productivity on dual-purpose breeds tends to be lower and production costs be higher than those of single-purpose breed.

- Lower performance (egg yield, growth rate), which implies that i) feed, labour and housing costs per kg output and ii) environmental impacts per kg output are higher than in single-purpose breed. However, improved health and robustness of the birds may reduce veterinary costs and animal health and welfare issues.
- Numbers to follow..

- Revenue streams
- Because of higher production costs and higher welfare of products, consumers need to pay a higher price for eggs and meat.
- The new choice of cuts (smaller chicks and pieces of meat) may increase or decrease

PPILOW – Results: Economic considerations

Costs of production of male of dual purpose breeds in Germany – PPILOW WP 7 first results

On-station trial of the males of selected dual purpose genotypes in Germany

	Genotype A	Genotype B	Genotype C	Genotype ISA 757
Feed Conversion Ratio (FCR)	3,4	3,5	3,4	2,7
Daily weight gain (g/day)	26,1	20,8	19,3	44,6
Average feeding period (days)	83	83	83	85
Total feed consumed per bird (g)	7.444	6.069	5.478	10.217
Final live weight (g)	2.203	1.763	1.634	3.831
Mortality at farm level (%)	1,1	1,1	2,1	3,3

Performance indicators

- Genotypes A, B and C: high feed conversion ratios
- Genotype C: lowest daily weight gain
- Genotypes A and B: lowest mortality rate
- Control group: fattening hybrid ISA 757 - most efficient feed conversion ratio

PPILOW – Results: Economic considerations

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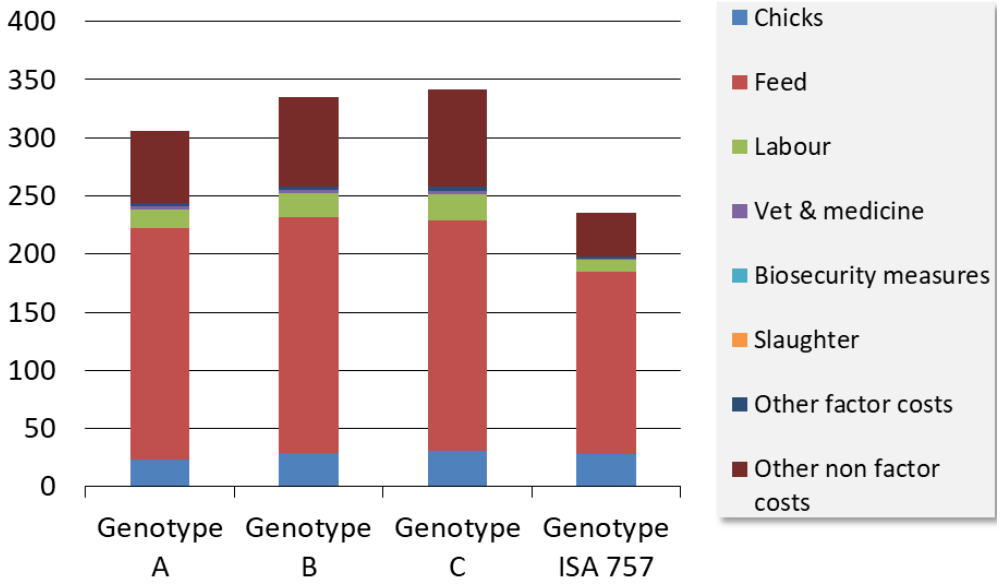


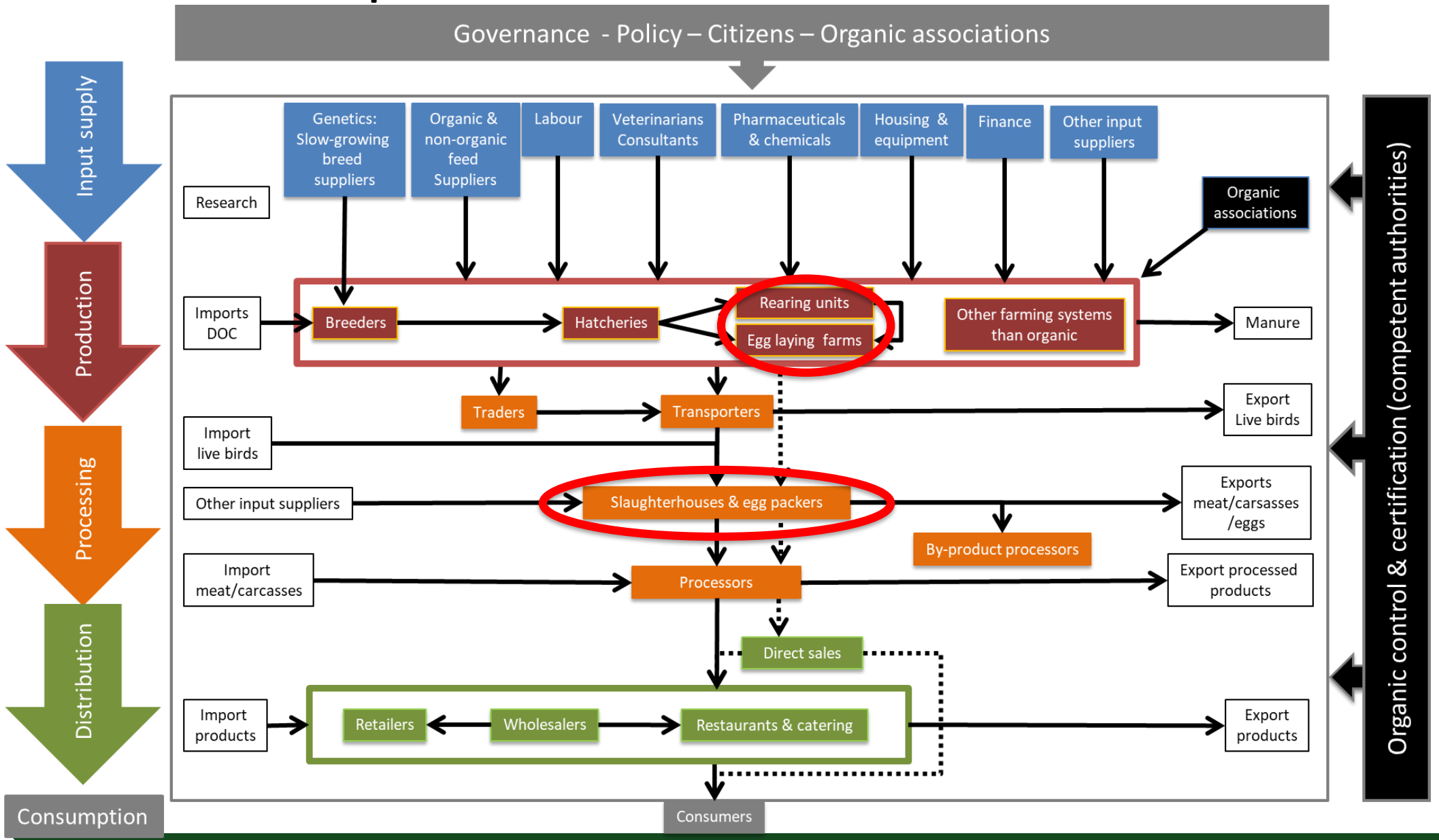
Impact on production costs on farm level:

- Genotype (GT) A: lowest production costs among dual-purpose genetics
- Full cost differences: GT A to control group ISA 757: 70 €/100 kg LG
- GT C to control group ISA 757: 107 €/100 kg.

Conclusions

- The more emphasis on laying performance the dual purpose genotypes have, the poorer the feed conversion and the higher the production costs
- The higher the production costs are for fattening male dual purpose breeds, the higher the selling prices should be for the cock (to cover costs). Alternatively, the costs can be "cross-subsidised" via a price premium for eggs

PPILOW – An example of a value chain



PPILOW – Dual-purpose breeds

- An opportunity especially for organic farming and for short supply chains
- Male chicks of dual-purpose breeds can replace slow-growing breeds in organic production
  ➔Consumers who appreciate slow-growing broilers, reduced need for parent flocks.
- Less Niche market for extensive systems that focus on "naturalness“, for ethically conscious and/or better-informed consumers, and for small families or senior people consuming smaller portions
- Potential for novel practices such as slaughtering different sizes of genotypes, smaller birds (just for two persons to eat), new products for pets/zoo animals?
- Branding and awareness-raising among the consumers to gain adequate sales & price premiums.
- demanding nutritional requirements & robustness towards climatic challenges.
- R&D and enhancing feed efficiency and laying and growing performance is needed.
- Proper training and knowledge on management (e.g. feather pecking, pullet rearing, feeding), changes in the farming system (dual products & animals) are needed
- A partnership across the value chain is essential.

PPILOW – Early sex determination using in-ovo method

- Ethically more sustainable egg production for **ethically** conscious consumers
- Key partners of the value chain are genetic companies, hatcheries, animal breeding companies, feed suppliers, veterinarians, pharmaceutical companies, farmers, housing and equipment suppliers, financial sector, certification organizations, transporters, slaughterhouses, retailers and consumers.
- Investments in and maintenance of in-ovo sexing device, potential abandoning of male chicks' crushing equipment, the training of staff incur costs
- New efforts put in the processing of male eggs. Need for R&D?
- Well-thought consumer awareness-raising campaign about ethically sustainable egg production.
- Dialogue between retailers and producers about ethical standards.
- If enforced by law, public support may be needed to adjust and to adopt the technique.

Concluding remarks

- Dual-purpose breeds and in-ovo sexing addressing an ethical issue associated with the killing of one day old male chicks.
- Increased consumer awareness of the benefits of these methods is needed. This is essential to make the practices more common.
- While in-ovo sexing is targeting only egg markets, dual-purpose breeds are targeting both egg and chicken meat buyers.
- Although two products are obtained, the productivity (e.g. feed efficiency, growth) on dual-purpose breeds tends to be lower and production costs be higher than those of single-purpose breed.
- Dual-purpose breeds might fit well (and better than in-ovo sexing) into organic systems, as both involve a holistic and natural approach and in broiler production and both involve slow-growing genotypes.

PPILOW **PARTNERS**

Thank you for your attention

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