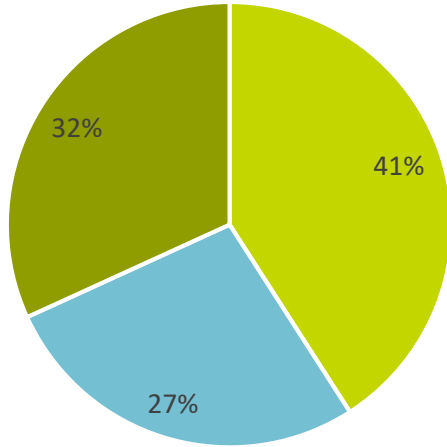


Producing BSF larvae with common Western European horticultural residues

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Origin plant residues

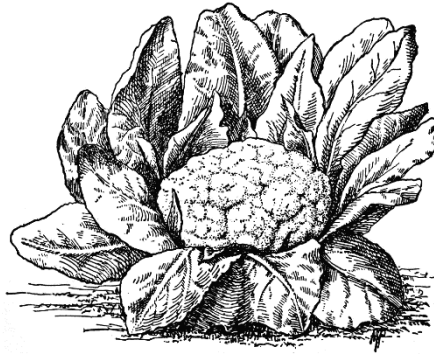


- Sprouts 27 tonnes/ha
- Leaves 18 tonnes/ha
- Stalks 21 tonnes/ha



Potential biomass

Brussels sprouts	420 000 tonnes	stalk and leaves	(B, N, UK)
Chicory	150 000 tonnes	roots	(B, N)
Cauliflower	154 000 tonnes	foliage	(B)
Tomato	100 000 tonnes	stems	(B, N)
Beans	30 000 tonnes	foliage	(B)



BSF nutritional requirements

	BSF requirements	Brussels sprouts stem and leaves	Chicory roots	Cauliflower foliage	Tomato stems	Bean foliage
Moisture content (% FM)	70	85	88	90	75,8	86
Crude protein (% DM)	15	18	10	23	5,4	16
Starch & sugars (% DM)	40	41	70	15	NA	25.6

Goals and reasoning

Assessing residues in a balanced diet

Corrected for:

→ Dry matter

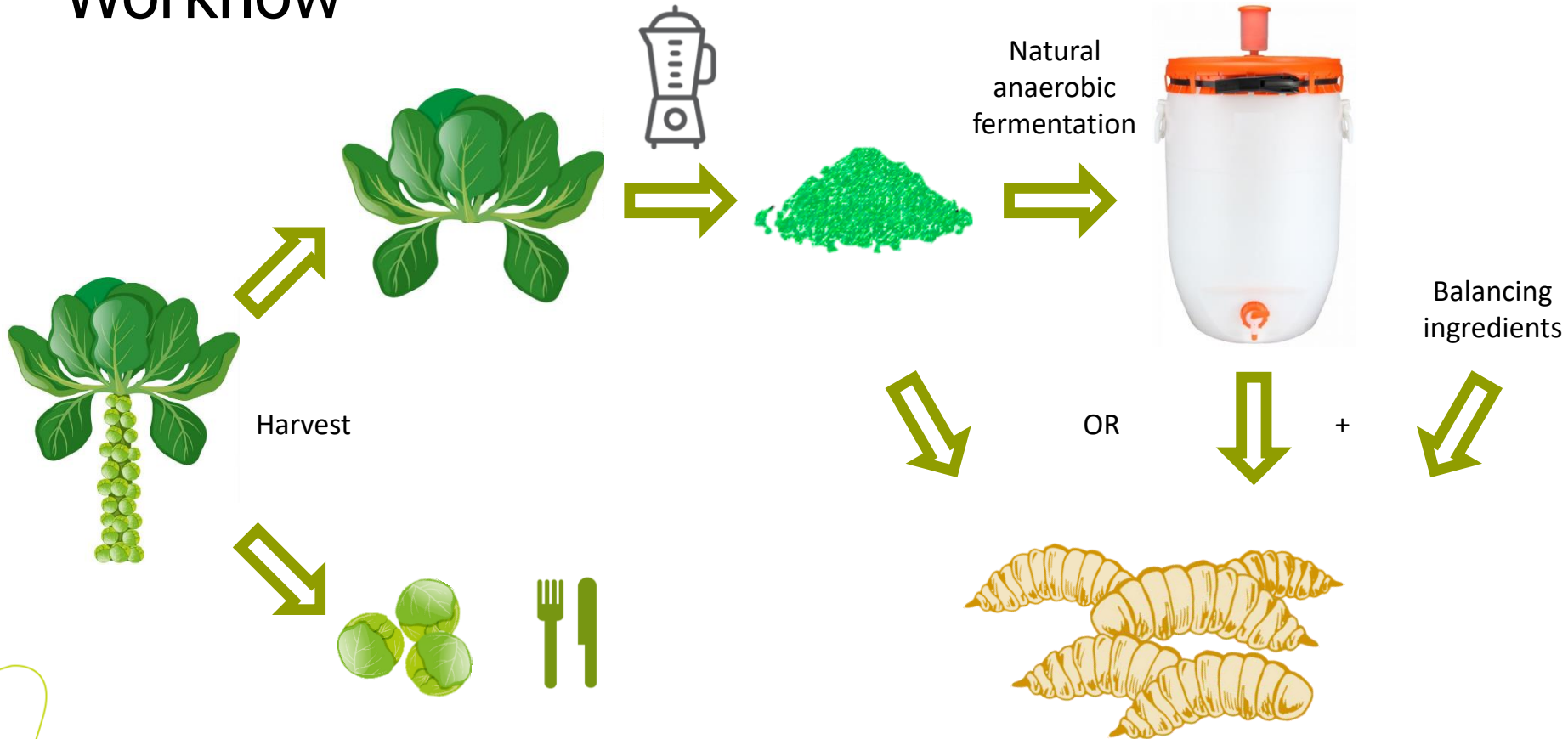
→ Protein

→ Sugars and starch (non-fiber carbohydrates)

Balancing by adding dietary components used in pig farming

Maximizing dietary inclusion of the residue

Workflow

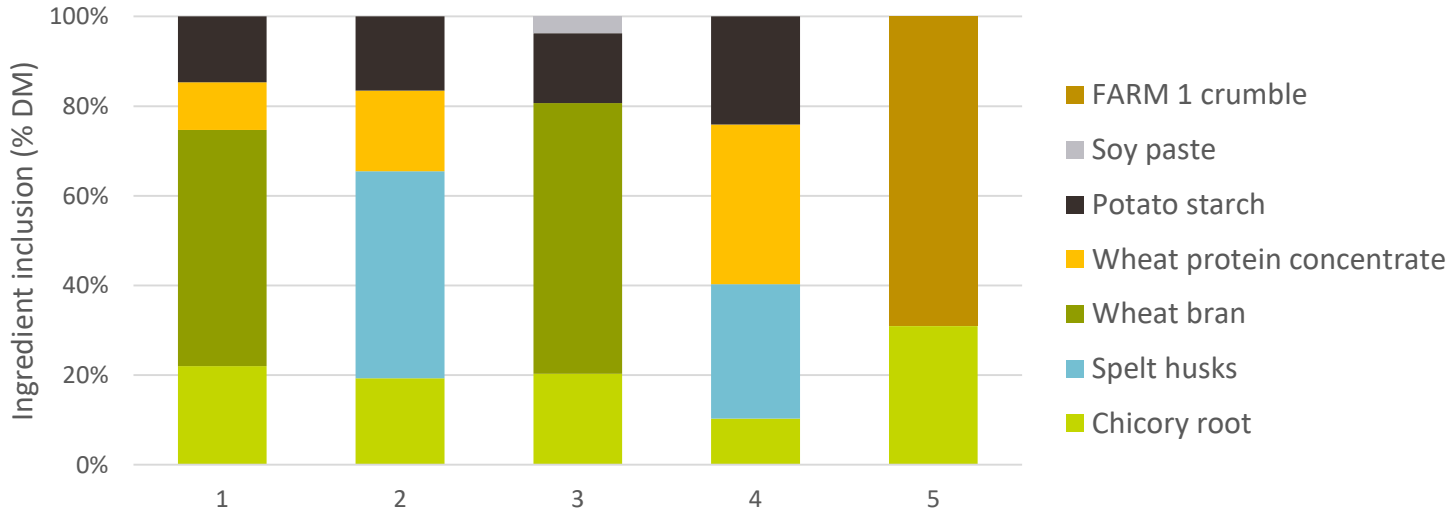


Fresh VS fermented chicory roots



Fresh VS fermented chicory roots

± 20 000 5-DOL per box (60 x 40 cm) with 10 kg wet feed (R = 3)



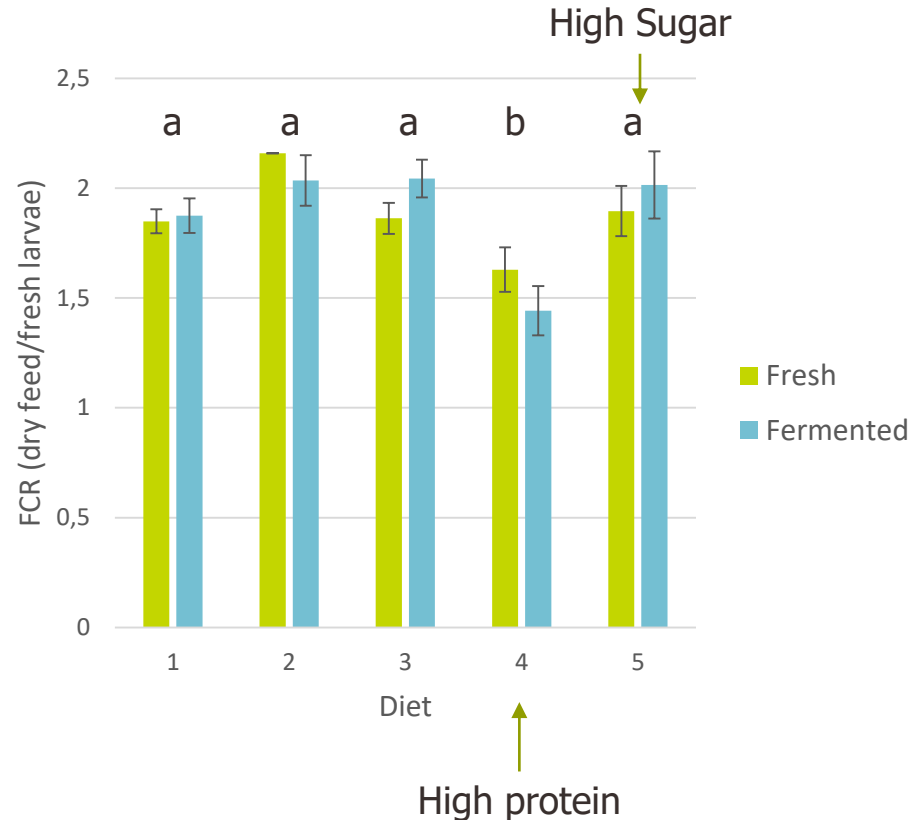
Protein (% DM)	11 (+1)	15 (+1)	9 (+2)	Fresh / Fermented
Starch & sugars	50 (- 5)	40 (- 2)	66 (- 7)	

Fresh VS fermented chicory roots

No observable difference between fresh or fermented residues

Growth with 15 % protein > 10 % protein

More sugars, no influence

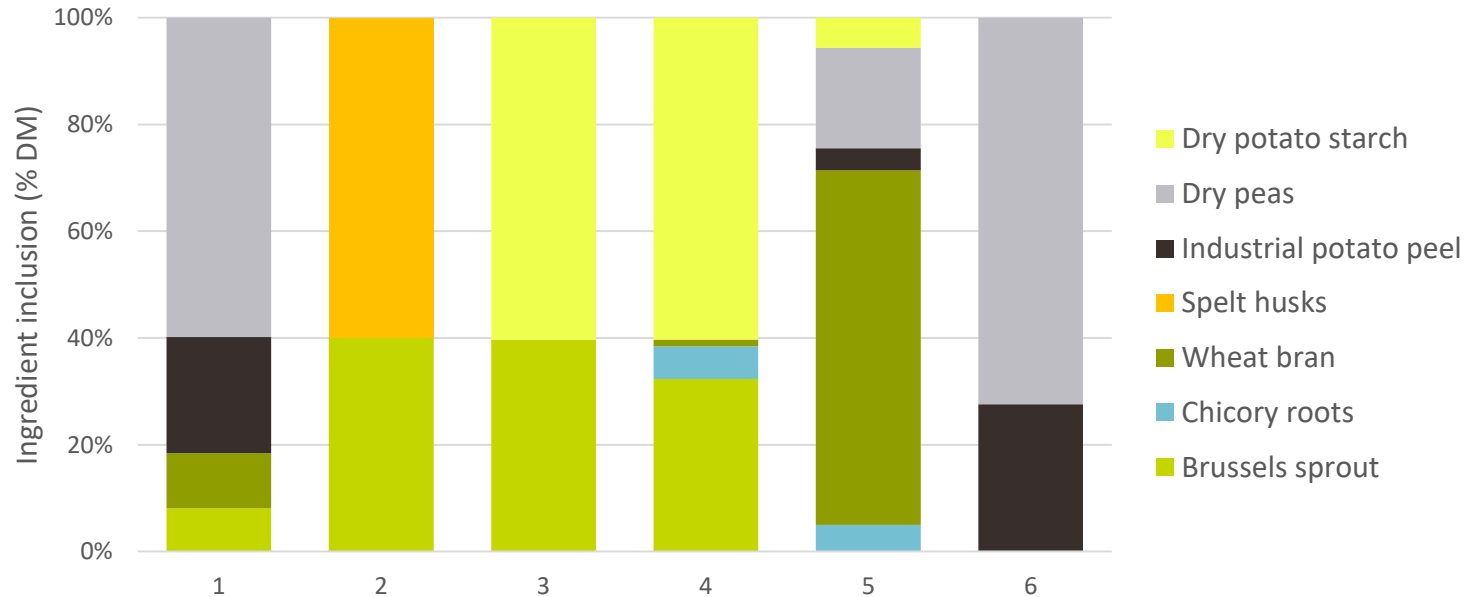


Fermented Brussels sprout stalks & upper leaves



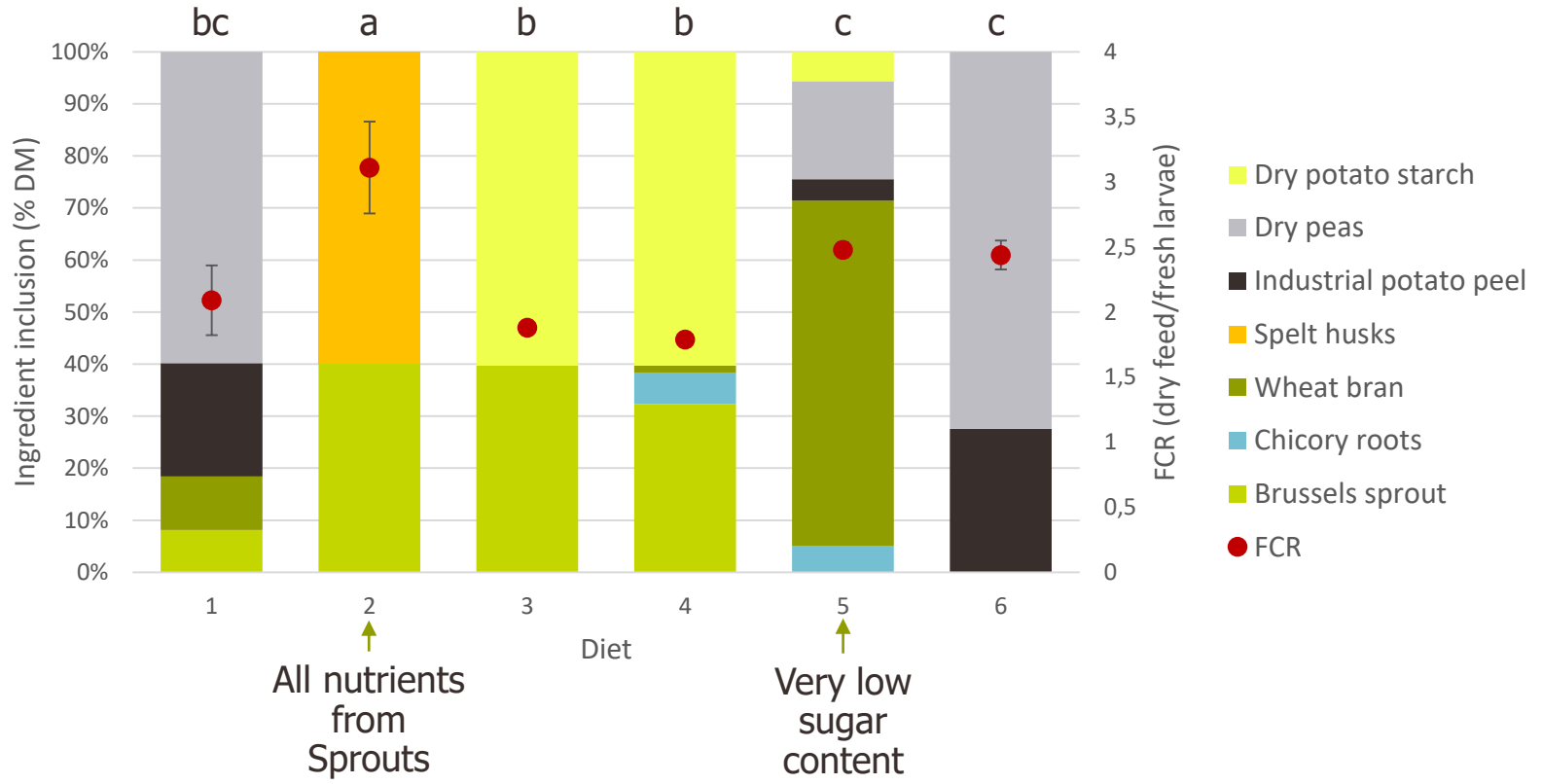
Fermented Brussels sprout stalks & upper leaves

± 20 000 5-DOL per box (60 x 40 cm) with 10 kg wet feed (R = 3)



	1	2	3	4	5	6
Crude protein (% DM)	15.3	16.4	16.8	15	15	14.5
Starch & sugars (% DM)	54	40	49	53	25	51

Fermented Brussels sprout stalks & upper leaves



Conclusion

Protein potential

Brussels sprout stalk & leaves

Per hectare:

39 T residues / ha → 1.1 T sprout protein

5 T fresh BSFL / ha → 0.3 T BSF protein / ha (coming from the residues)

Yearly total:

420 000 T residues → **3 500 T BSF protein**

Conclusion

Horticultural residues can be a decent ingredient of a balanced BSF diet

Huge potential of (legal) biomass

Inclusion limited due to high moisture content

Remarks / future research

What about pesticides?

Getting the residues of the field



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Questions?

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