



Flavour drives consumer eating quality acceptability as intramuscular fat increases in Australian lamb

S.M. MOYES, D.W. PETHICK, G.E. GARDNER, L. PANNIER

Outline

Consumer eating quality assessment

Outcomes in beef

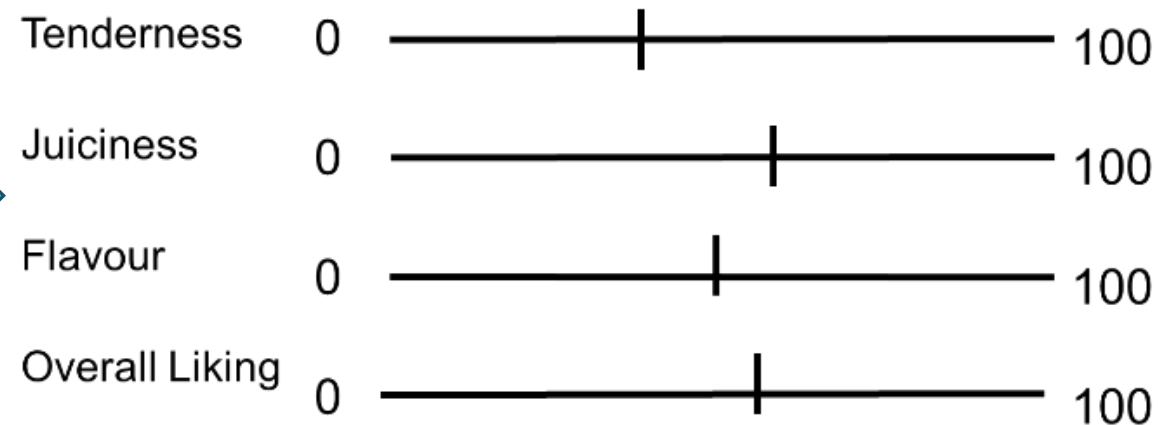
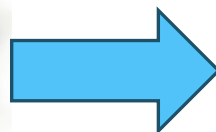
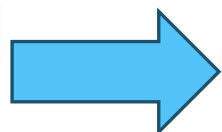
Importance of intramuscular fat on lamb eating quality

Contributions of tenderness, juiciness and flavour to overall liking

Future implications



Meat Standards Australia



Correlations between sensory traits

A diagram illustrating the Halo effect. On the left, a diverse group of people is shown. A blue arrow points from this group to a large green rounded rectangle in the center. Inside the rectangle, the text "Problem: Halo effect" is written in white. To the right of the rectangle, there are four horizontal black lines, each representing a scale from 0 to 100. Each line has a vertical tick mark at the 100 position. The top line has a tick mark at the 0 position. The second line has a tick mark at approximately 25. The third line has a tick mark at approximately 50. The fourth line has a tick mark at approximately 75.

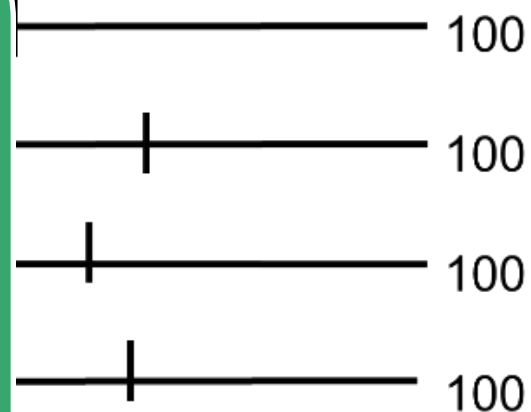
Problem: Halo effect

Correlations between sensory traits

Problem: Halo effect



	Tenderness	Juiciness	Flavour
Overall liking	0.80	0.80	0.91
Tenderness		0.73	0.71
Juiciness			0.74



Aim

Correlations with overall liking

Tenderness	0.80
Juiciness	0.80
Flavour	0.91



Tenderness
Juiciness
Flavour



CONTRIBUTION



Overall liking

Contributions to overall liking: beef

Overall liking = $-0.8 + 0.7 \times \text{Flavour} + 0.3 \times \text{Tenderness} + 0.1 \times \text{Juiciness}$

Contributions to overall liking: beef

$$\text{Overall liking} = -0.8 + 0.7 \times \text{Flavour} + 0.3 \times \text{Tenderness} + 0.1 \times \text{Juiciness}$$

Sensory trait	Relative importance analysis
Flavour	39%
Tenderness	31%
Juiciness	24%

Contributions to overall liking: beef

Overall liking = -0.8

Tenderness + 0.1*Juiciness

Sensory trait

Flavour

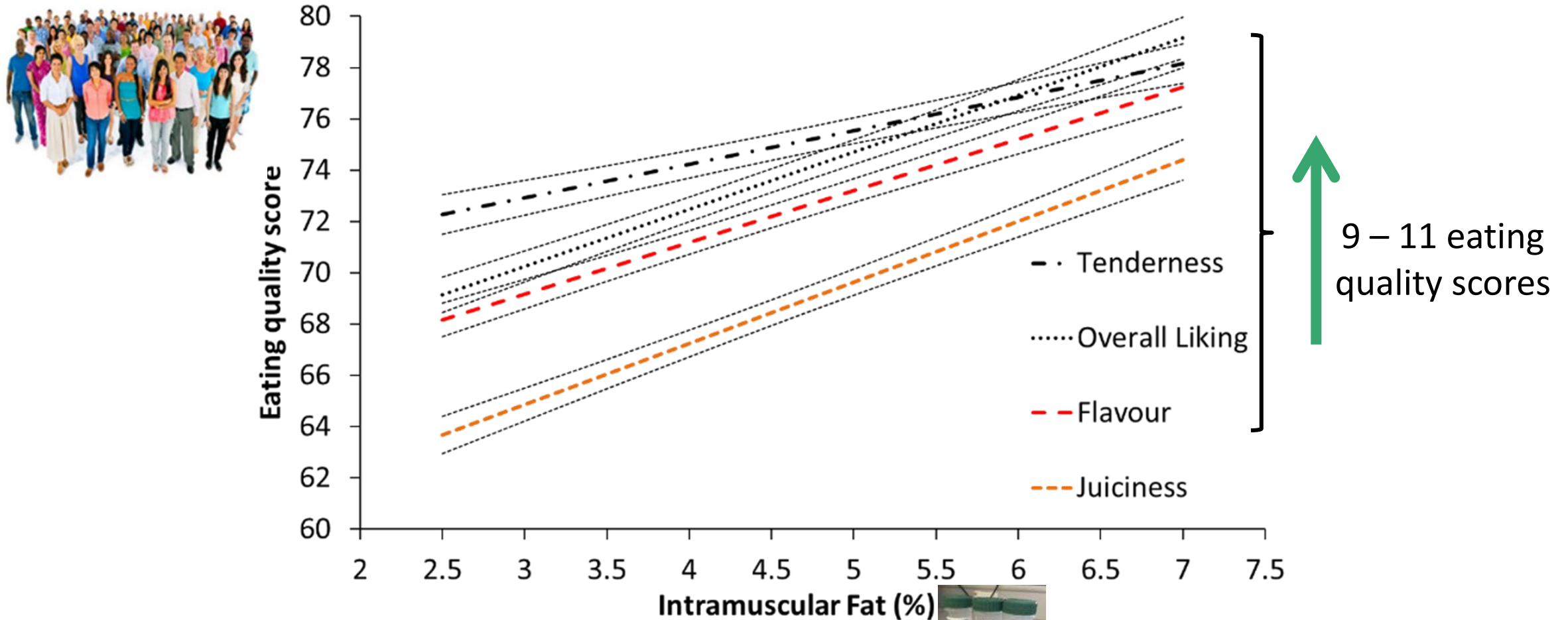
Tenderness

Juiciness

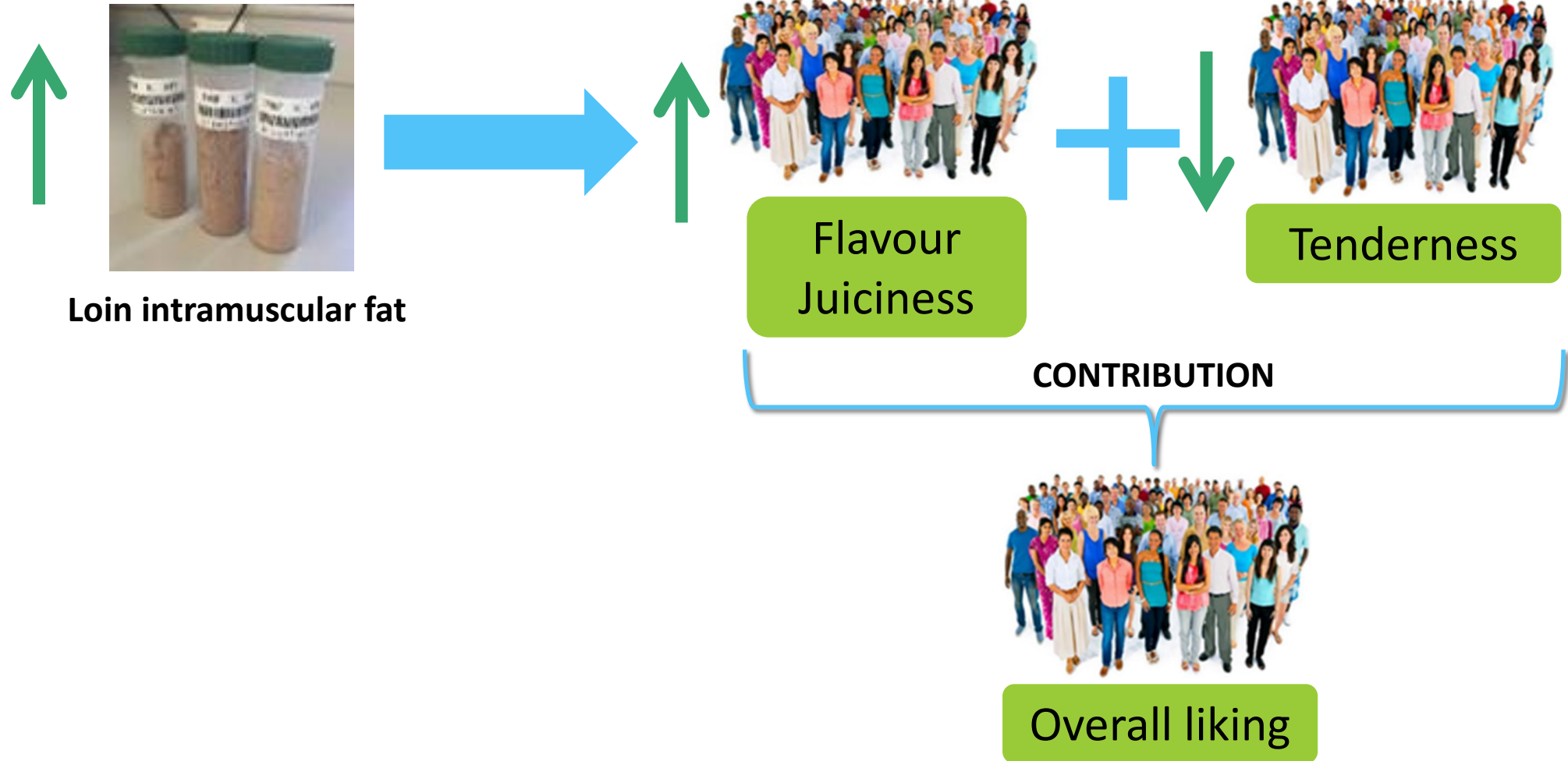
Distance analysis

Intramuscular fat

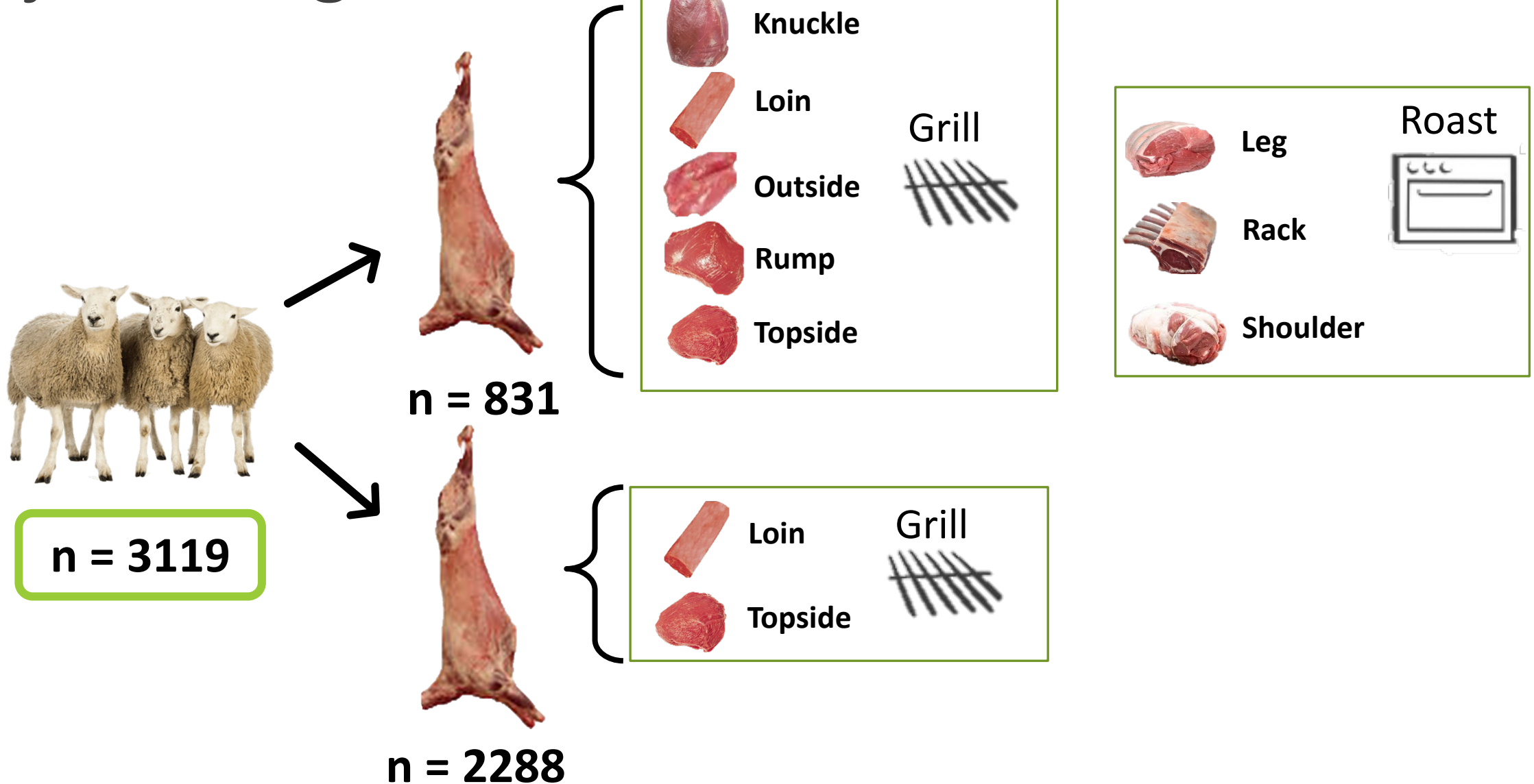
Intramuscular fat affects all sensory traits



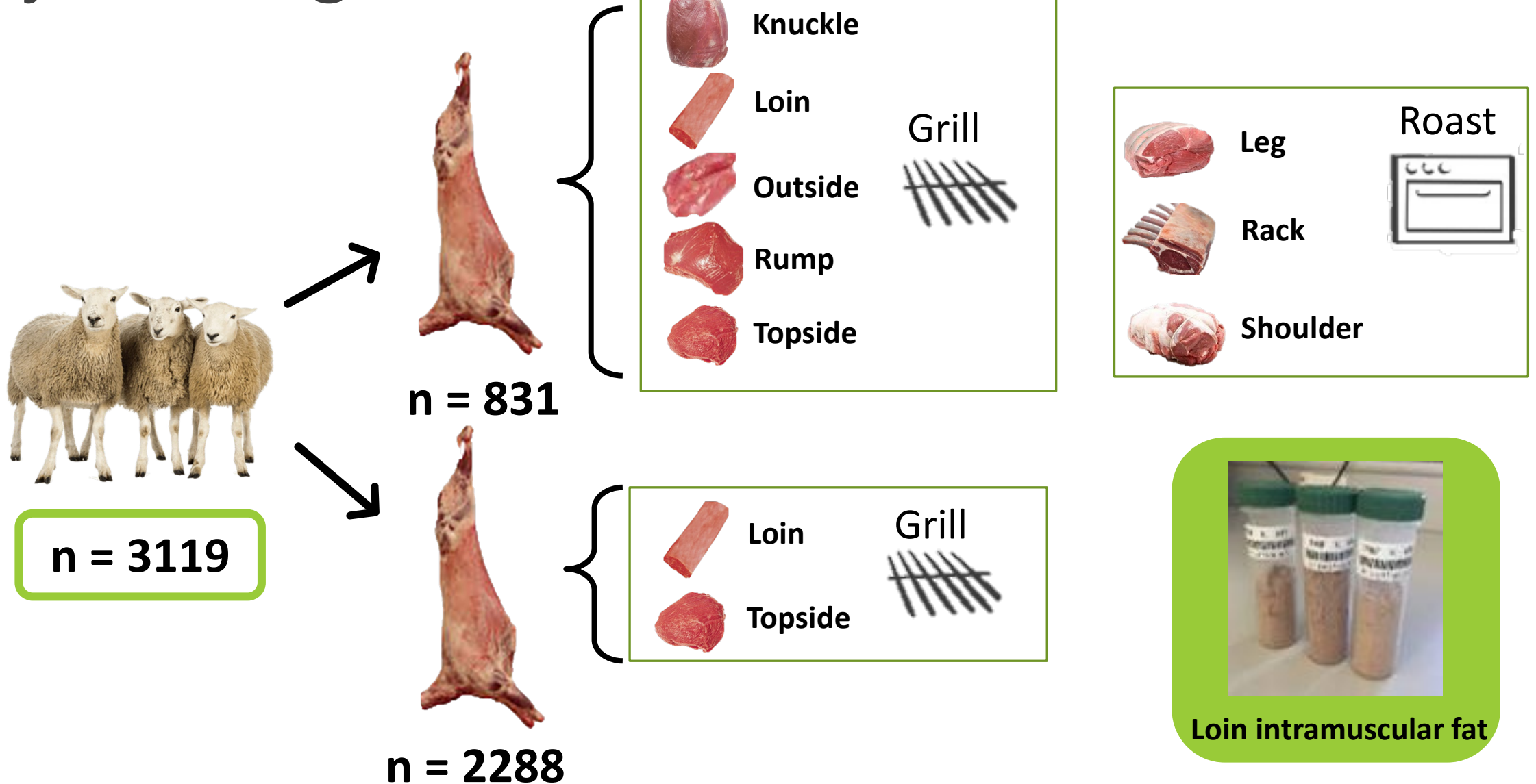
Hypothesis



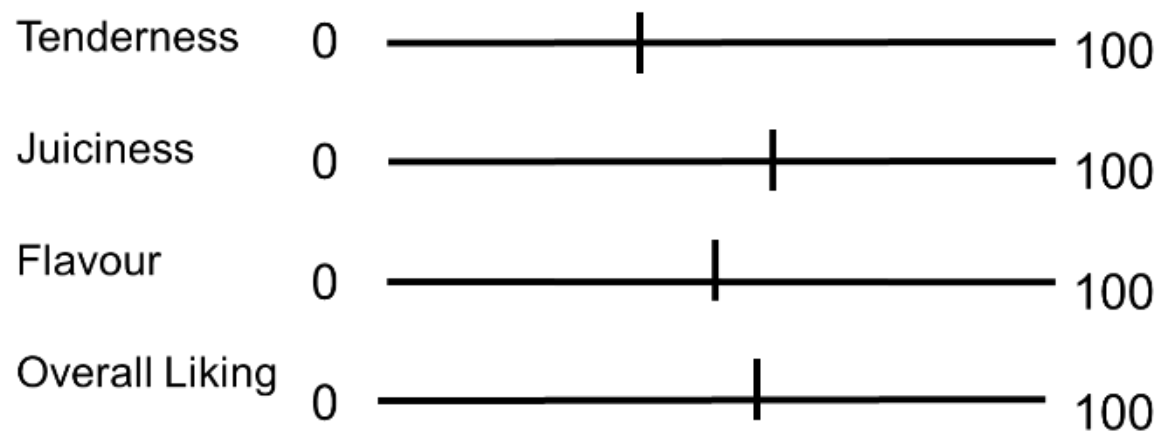
Project design: cuts



Project design: cuts



Project design: sensory sessions



- 11 232 cuts across 312 sessions
- 18 720 consumers
- 10 responses per cut
- 112 320 consumer responses

Statistical analysis (R Studio)

Ten individual
consumer
responses



Statistical analysis (R Studio)

Ten individual
consumer
responses



Linear
regression
model



Overall liking = Tenderness + Juiciness + Flavour

Statistical analysis (R Studio)

Ten individual
consumer
responses



Linear
regression
model



Relative
importance
analysis

Calculate the contribution of eating quality traits as
independent and co-dependent contributors to overall liking

Statistical analysis (R Studio)

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Linear
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Relative
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Calculate the contribution of eating quality traits as
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All data

Intramuscular fat quarters

2.0-4.0%

4.1-6.0%

6.1-8.0%

8.1-12.8%

Contributions to overall liking

$$\text{Overall liking} = -0.3 + 0.6 * \text{Flavour} + 0.2 * \text{Tenderness} + 0.2 * \text{Juiciness}$$

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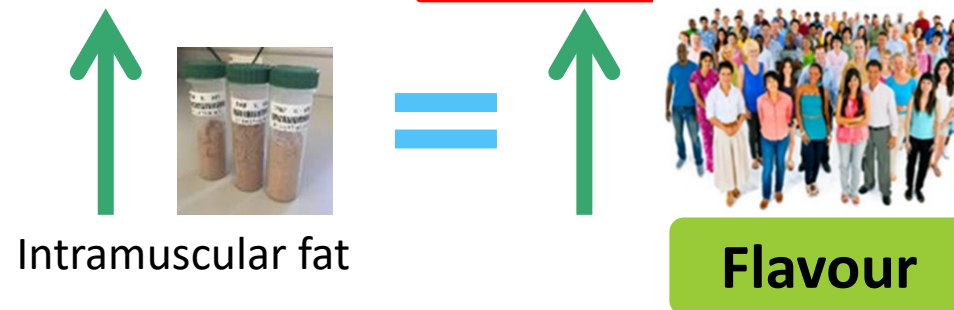
Sensory trait	Relative importance analysis
Flavour	45%
Tenderness	28%
Juiciness	27%

Contribution to overall liking – intramuscular fat quarters

Intramuscular fat quarter	Consumer answers	Flavour	Tenderness	Juiciness
2.0-4.0	19 800	44% ^a	29% ^a	28% ^a
4.1-6.0	65 270	45% ^{a,b}	28% ^a	27% ^a
6.1-8.0	20 070	46% ^b	28% ^a	26% ^a
8.1-12.8	3 220	48% ^c	26% ^b	26% ^a

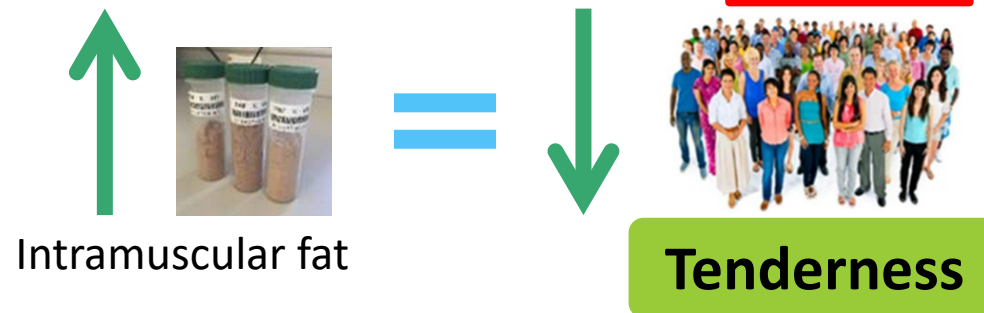
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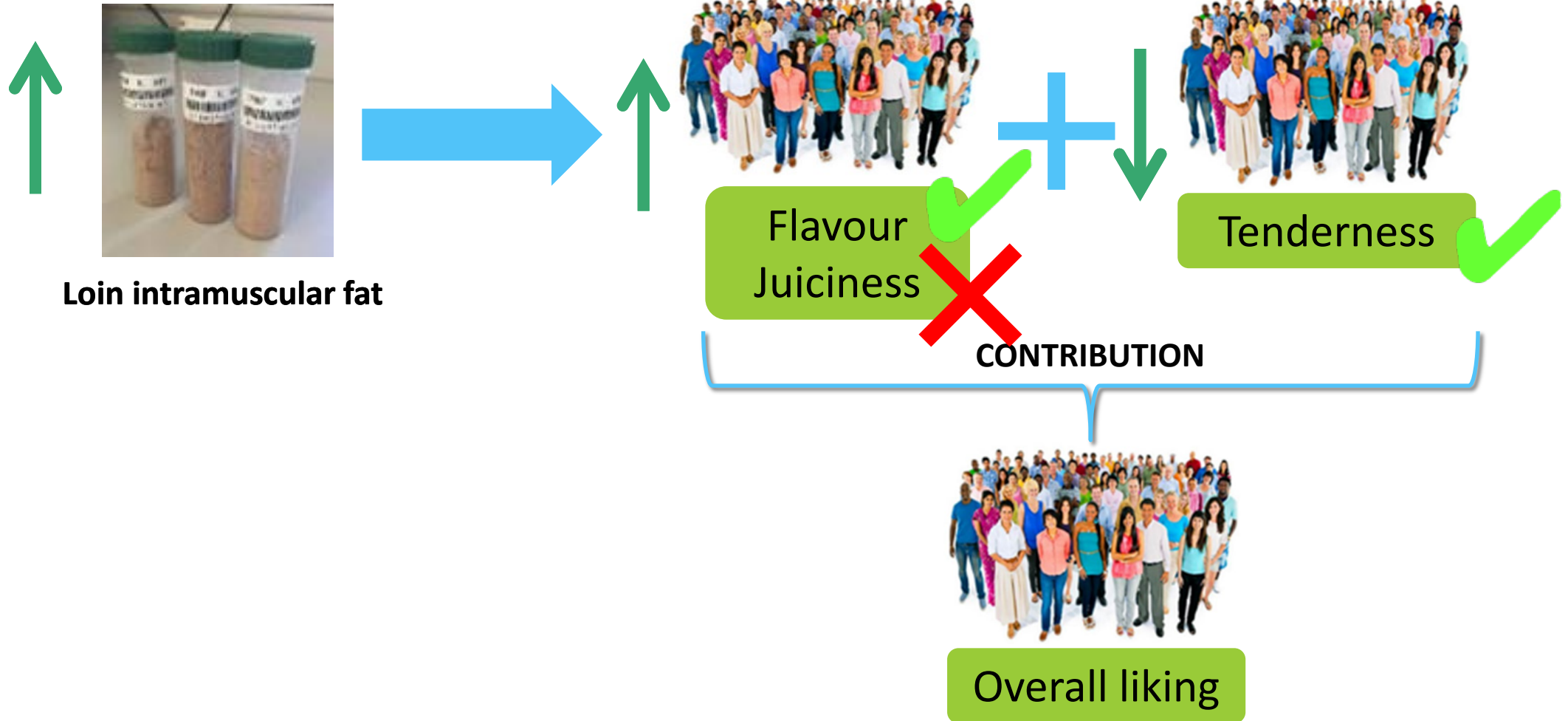


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Hypothesis



Key Results

Increased contribution of flavour to overall liking by 4%



Loin intramuscular fat
(10.8% range)

Key Results



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Increased contribution of flavour to overall liking by 4%

Reduced the contribution of tenderness to overall liking

Key Results



Loin intramuscular fat
(10.8% range)

Increased contribution of flavour to overall liking by 4%

Reduced the contribution of tenderness to overall liking

No effect on the contribution of juiciness to overall liking

Future research



Explore the contribution of sensory traits to overall liking within different cuts and cooking methods



Contribution of flavour may become more important as future genetic selection broadens range of intramuscular fat in lamb

Thank you



