Relationship of eating quality of different muscles

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DARD Project
on Beef Eating Quality

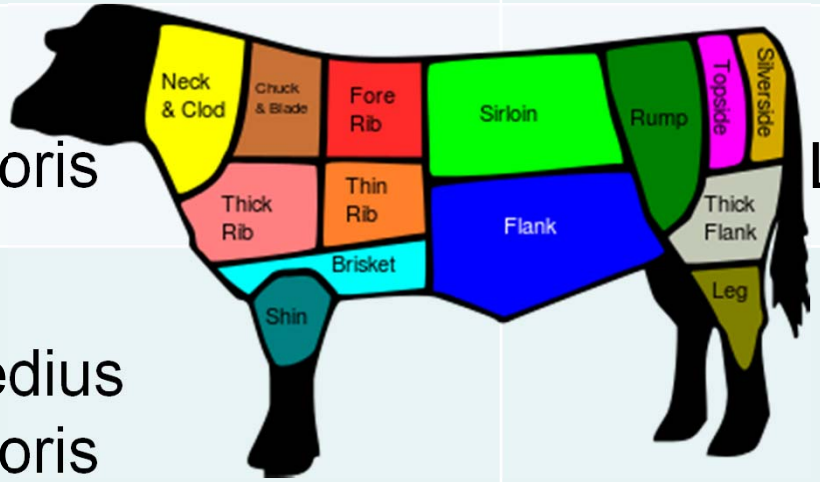
- Approx. 50% useable meat ⟶ mince
- Maximise quality of all cuts,
  minimise variability of HQ cuts

Cuts/muscles

Topside
Semimembranosus

Fillet/tenderloin
Psoas major

Silverside
Biceps femoris



Striploin
Longissimus dorsi

Rump
Gluteus medius
Biceps femoris

Knuckle
Rectus femoris

Cuts and muscles studied

Primal Cut		MSA code	Muscle Name
Fillet		TDR062	*Psoas major*
Striploin	- Anterior	STR045A	*Longissimus dorsi Ant*
	- Mid	STR045M	*Longissimus dorsi Mid*
	- Posterior	STR045P	*Longissimus dorsi Post*
Rump	- Cap	RMP005	*Biceps femoris*
	- Heart	RMP131	*Gluteus medius*
	- Heart (Eye)	RMP231	*Gluteus medius*
Topside		TOP001	*Adductor femoris*
		TOP073	*Semimembranosus*
Knuckle		KNU066	*Rectus femoris*
		KNU099	*Vastus lateralis*
Silverside - Outer		OUT005	*Biceps femoris*
	- Eye	EYE075	*Semitendinosus*

Experimental Protocol

- Meat Standards Australia (MSA) methods
- More than 6000 consumers
- 900 joints, 192 animals
- Grill panels
- Roast panels

} 36,000 tastings

Assessment of beef samples

Tenderness, juiciness, flavour liking and overall liking, e.g.,

Not tender

Extremely tender

- Satisfaction
  - ❑ **Unsatisfactory**
  - ❑ **Satisfactory everyday quality**
  - ❑ **Better than everyday quality**
  - ❑ **Premium**

RESULTS

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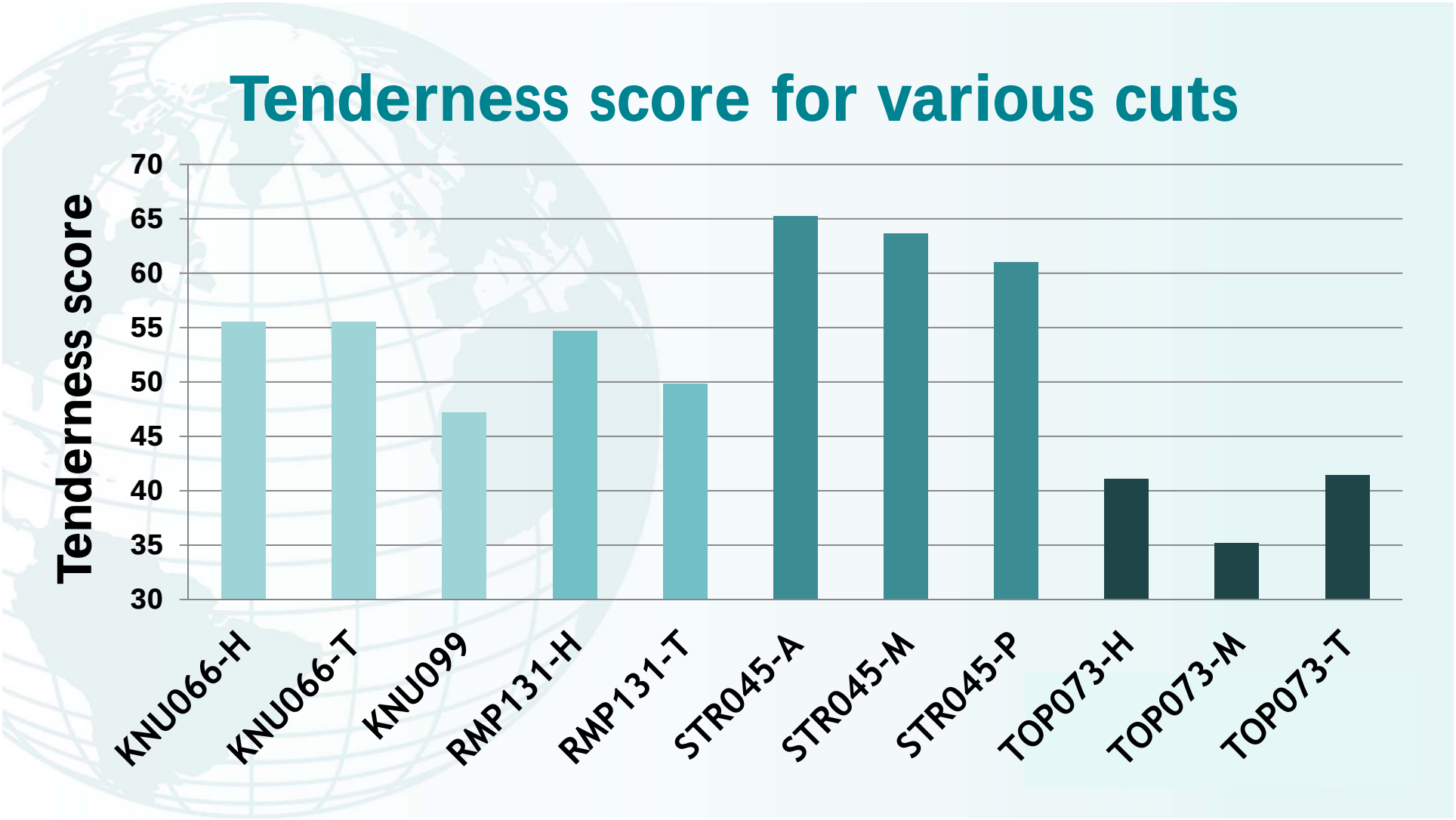
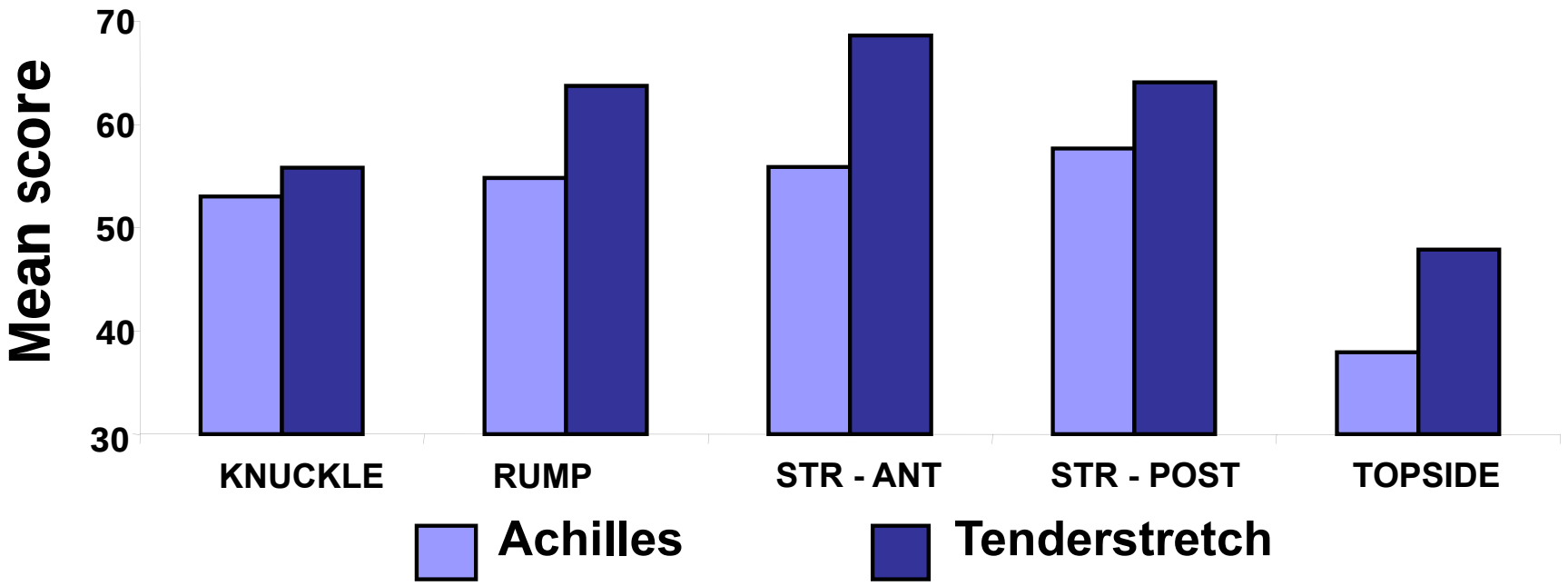

Tenderness score for various cuts
Tenderness score
70
65
60
55
50
45
40
35
30
KNU066-H
KNU066-T
KNU099
RMP131-H
RMP131-T
STR045-A
STR045-M
STR045-P
TOP073-H
TOP073-M
TOP073-T

Hanging method

Tenderstretching stretches some muscles on outside more than opposing muscles on inside

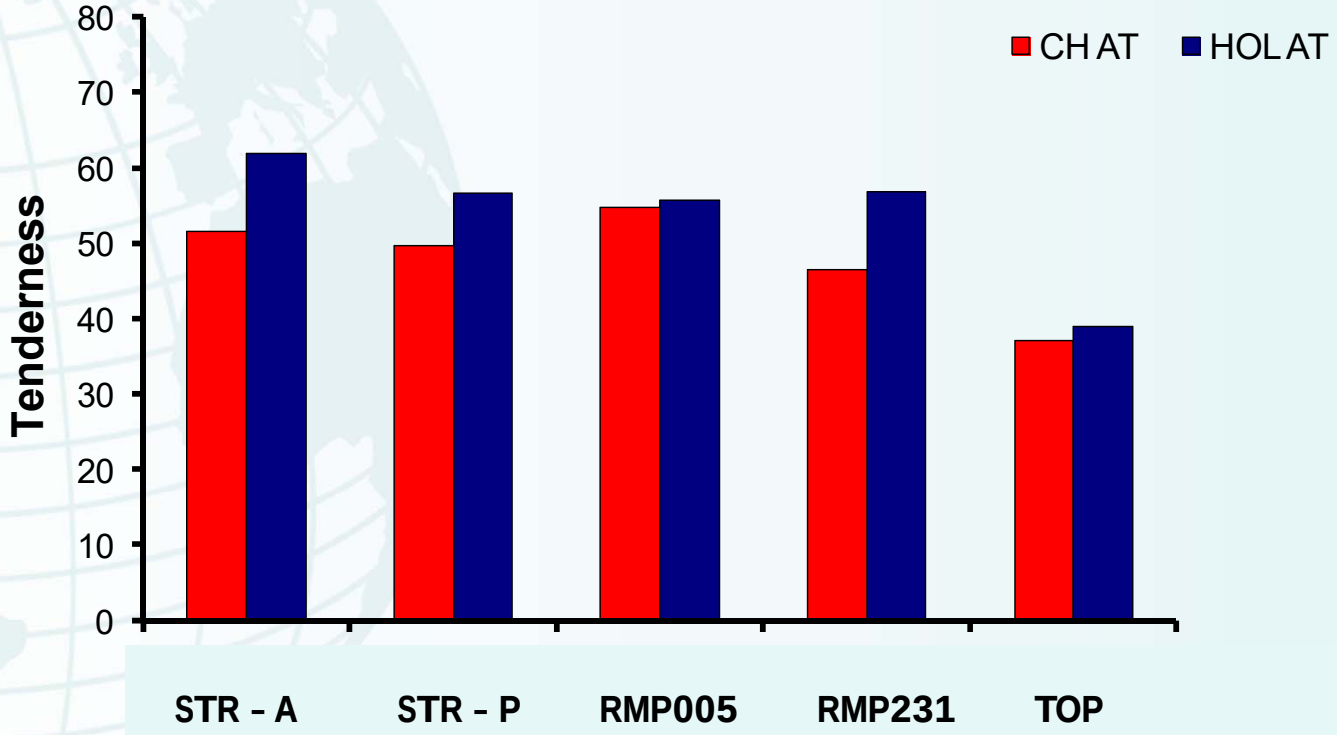
Effect of hanging method depends on muscle

Effect of hang x cut interaction on tenderness

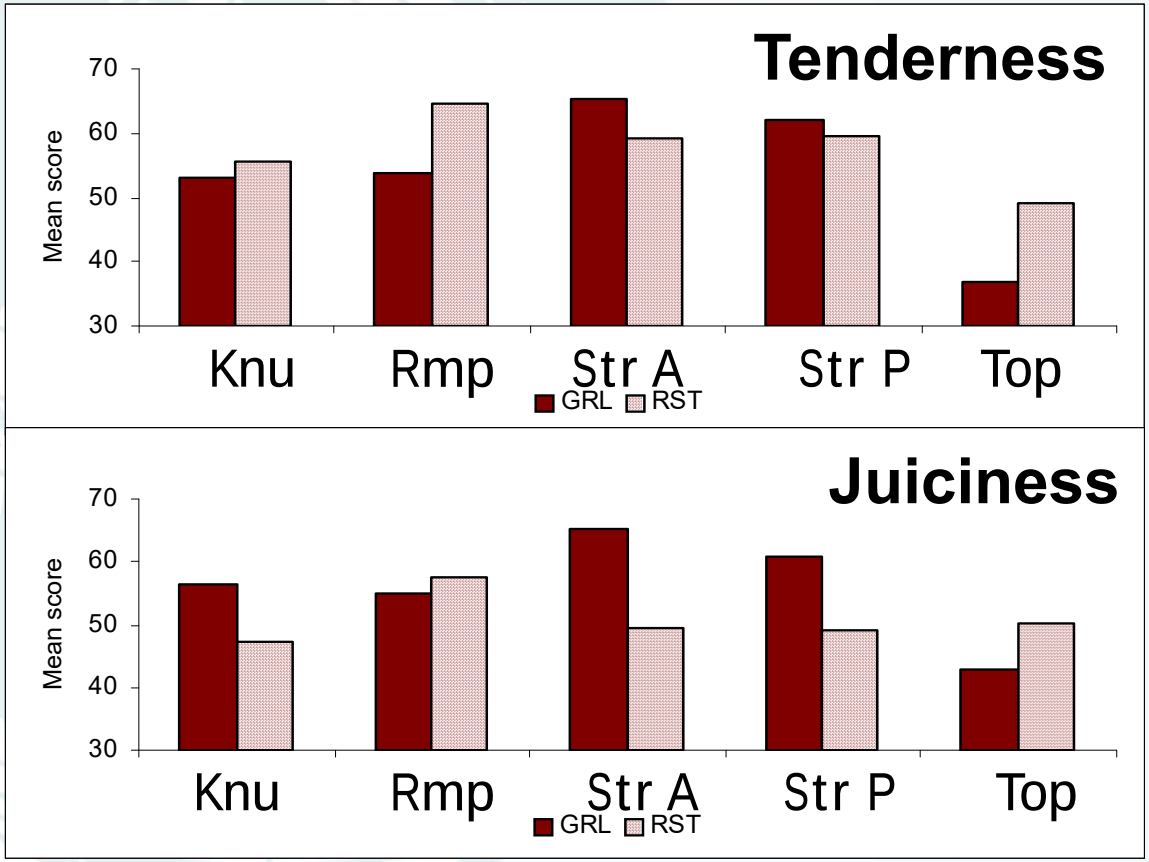


Breed x Cut

Achilles hung



Cut x Cook (GRL & RST)



Cooking method - significant effect on all traits except flavour liking

Striploin - higher scores when grilled than roasted

Rump and topside were better roasted

Correlation of tenderness

- Striploin tenderness often extrapolated to explain quality of whole carcase
- Is this valid?

Correlations between muscles:

When grilled or roasted

TS or AT

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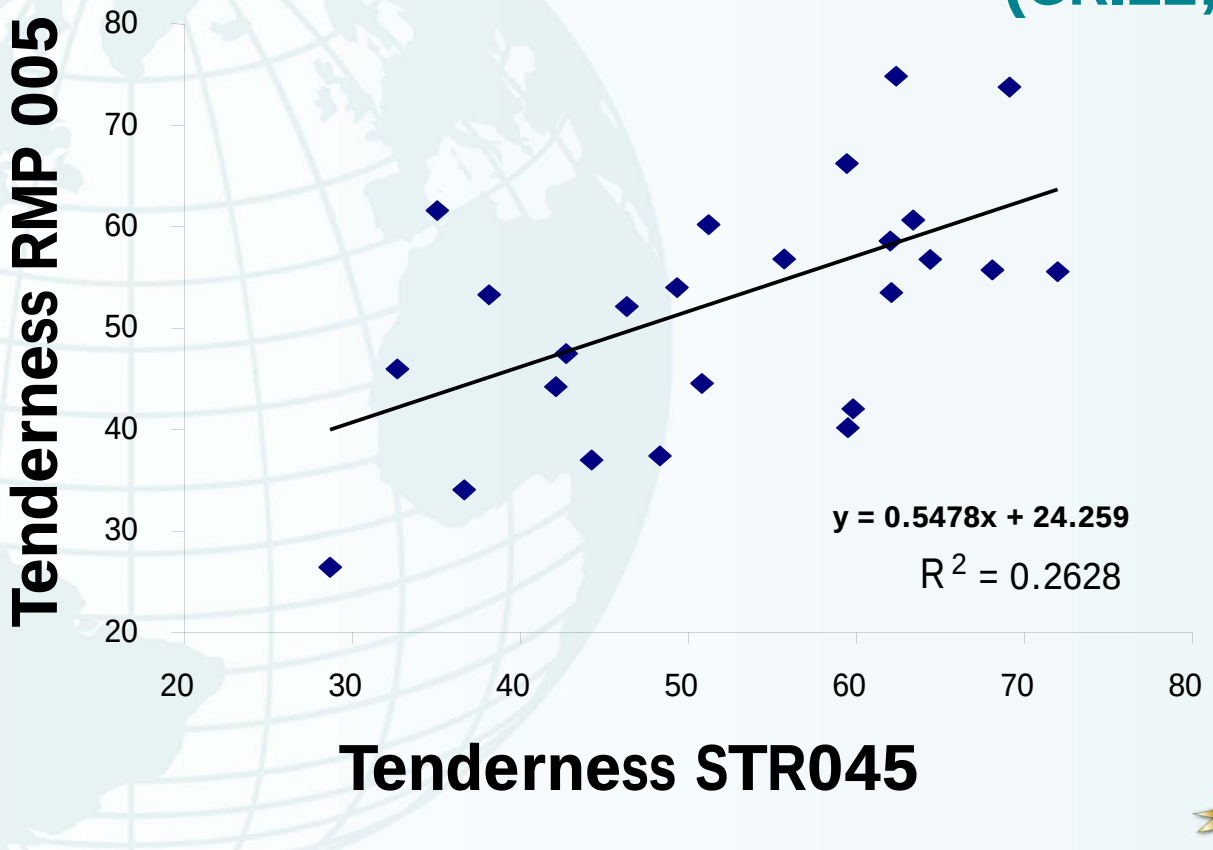
Correlation of tenderness for grilled steak cuts from tenderness score for striploin

Cooking Method	Hanging method	Muscle 1	Muscle 2	Sig	% variance explained
Grilled	AT	STRO45	RMP005	**	26.7
		STRO45	RMP131	**	17.7
		STRO45	RMP231	*	37.7
		STRO45	TOP073	*	6.2
	TS	STRO45	OUT005	ns	1.5
		STRO45	RMP005	ns	6.2
		STRO45	RMP131	ns	3.8
		STRO45	RMP231	ns	6.3
		STRO45	TOP073	ns	0.3

Striploin tenderness explains little of the variation in other muscles, especially when tenderstretch hung.

Correlation tenderness Rump cap vs. Striploin (GRILL, ACHILLES)



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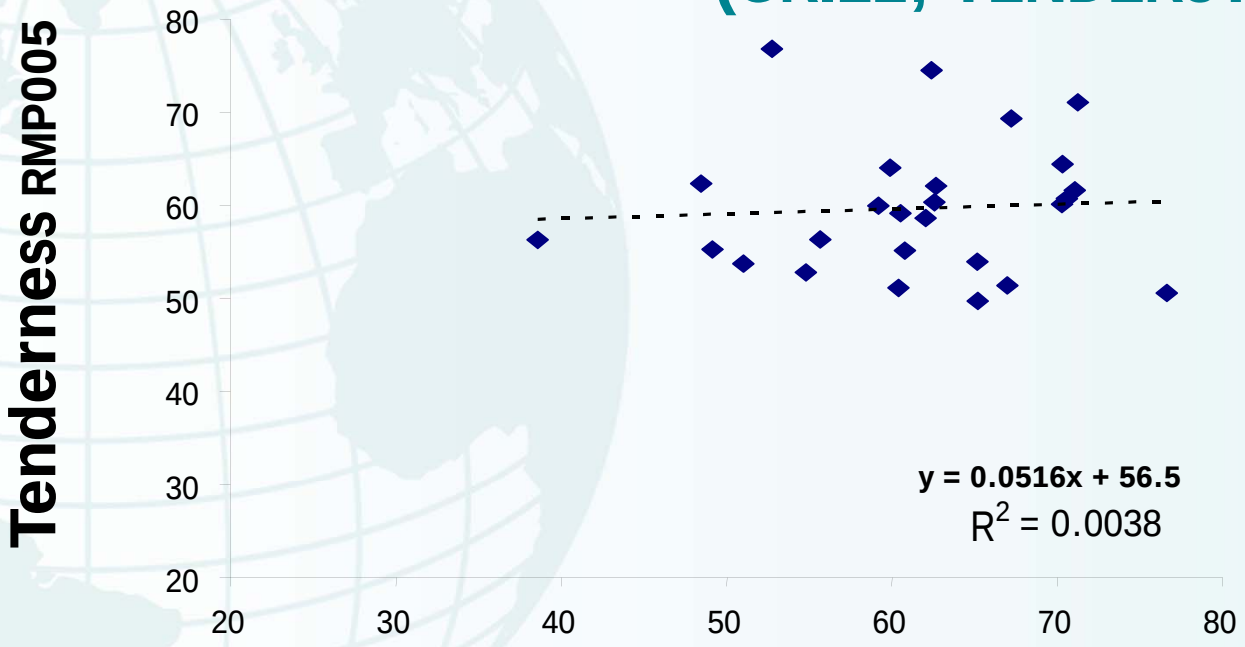
Correlation tenderness Rump cap vs. Striploin (GRILL, TENDERSTRETCH)



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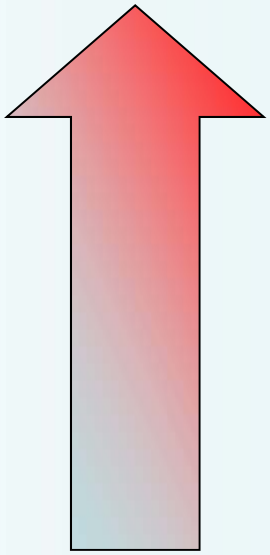
Correlation of tenderness for roasted beef cuts from tenderness score for striploin

Cooking Method	Hanging method	Muscle 1	Muscle 2	Sig	% variance explained
Roasted	AT	STRO45	KNU066	ns	0.1
		STRO45	RMP231	*	19.7
		STRO45	TOP073	**	16.8
	TS	STRO45	OUT005	ns	0.0
		STRO45	RMP131	*	8.2
		STRO45	RMP231	ns	7.9
		STRO45	TOP073	**	17.5

Striploin tenderness explains little of the variation in other muscles when roasted.

Factors
Cut or muscle
Position within muscle
Hanging method
Breed
Cooking method
Doneness



Interactions

Conclusions

- Production and processing factors are interlinked in their effect on eating quality
- One muscle cannot be used to predict the eating quality of another muscle
  - **Unless these factors are taken into account**