

Japan Consumer Trial Results



MLA Seminars, January 2007

Japanese Trial Consumer Objectives

- Evaluate the sensory response of Japanese consumers
- Evaluate responses across a full quality range x three cooking styles
- Provide data to enable linkage to segmentation study
- Compare to Australian consumers via paired samples
- Evaluate Japanese consumer sensory response to Japanese and Australian product

MSA Research Objectives

- Test MSA model prediction ability for Japanese consumers
- Test MSA model prediction ability for Japanese beef
- Accumulate data to allow refinement of the MSA model for high marbling and Wagyu cattle and to add shabu-shabu cooking.
- Build awareness of MSA test protocols
- Build a collaborative research base

Trial Design

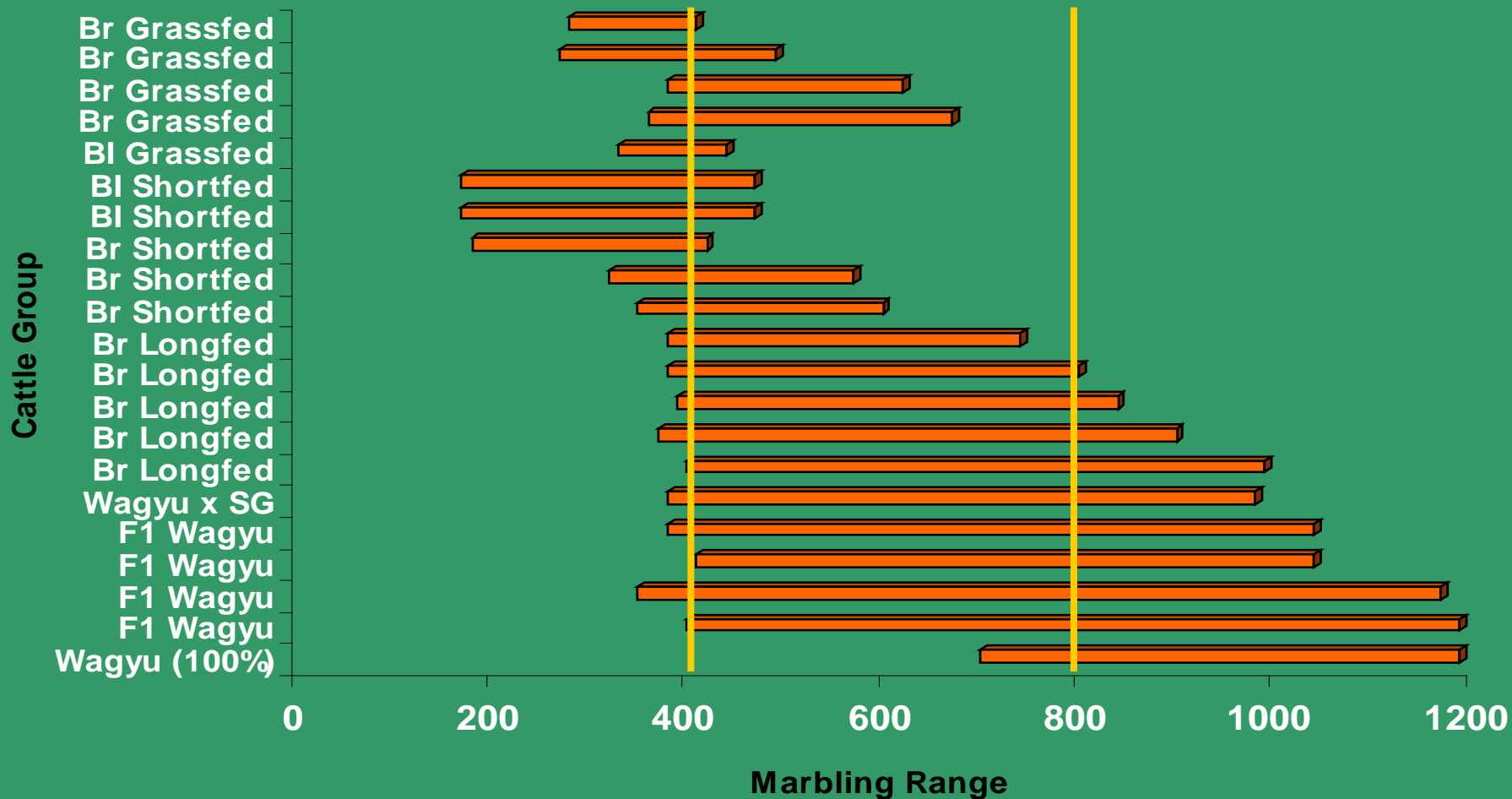
- 2 Japanese Cities – Tokyo and Osaka
- Grill, Yakiniku & Shabu-Shabu cooking methods
- 540 consumers per cooking method (Total 1620)
- 3 cuts – Striploin, Chuck & Outside Flat
- 3 Marbling ranges
- Two thirds Australian beef – Grass, short fed & long fed
- One third Japanese beef – Wagyu, Dairy and F1
- Matched pairs of the Australian Beef tested in Sydney

Australian Cattle Sourcing

- Australian cattle from all commercial groups offered
- Mix of British & *Bos-Indicus* breed types
- Grass fed, short and long grain fed groups
- 21 cattle groups, 12 suppliers, 11 abattoirs
- Cuts collected from 138 carcasses
- Selected for maximum marbling range within each group
(To allow separate analysis of marbling, breed & feed effects)

All in all a wide cross section of cattle utilised in the Japanese trade from a broad selection of suppliers

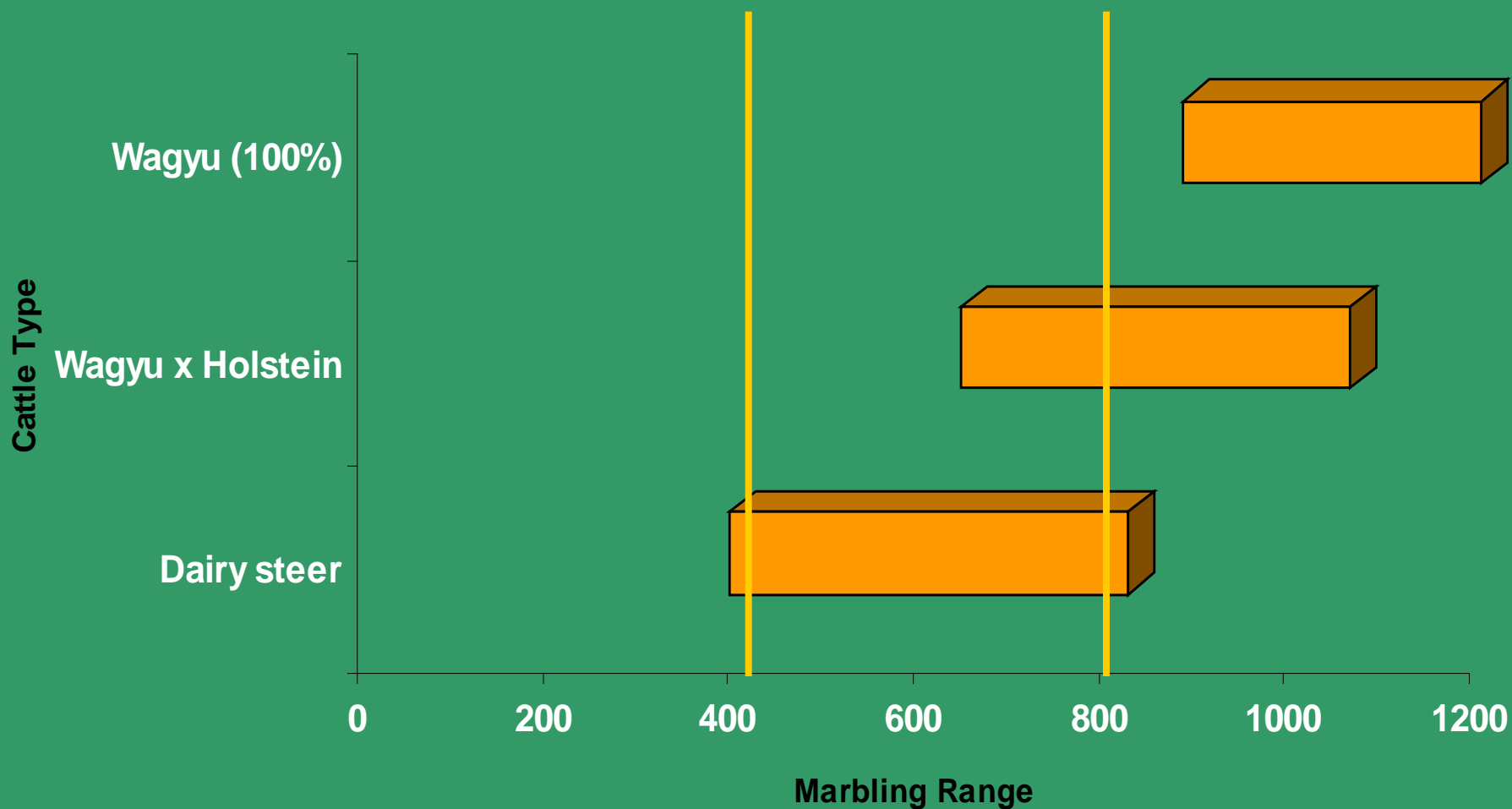
Marbling Range of Australian Trial Cattle By Group



Japanese Cattle Sourcing

- Cattle supplied by Starzen
- Carcasses selected from production at Akune plant
- Mix of Wagyu, F1 Wagyu x Dairy & Dairy
- Grading by JMGA & MSA (same MSA grader as Australian cattle)
- Maximum marbling range available selected within each cattle type
- Cuts collected at boning & transferred to Tokyo

Marbling Range of Japanese Cattle



MSA Grading at Akune

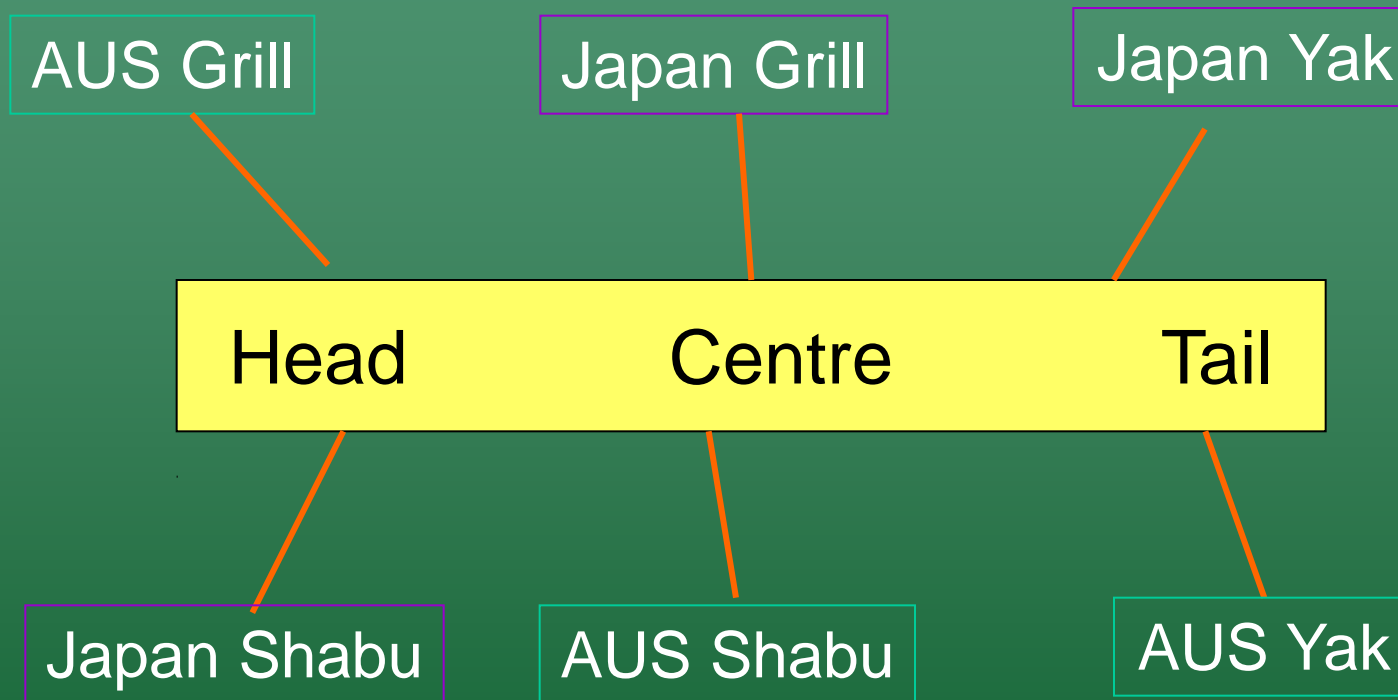


Sample Preparation & Allocation

- Samples for each cooking method rotated around positions with each cut
(Prevents confusion between a position & a cook effect)
- Samples used in each country rotated in balance
(Prevents confusion between country & position effects)

*Please note: Position effect should be minimal across entire result, however position effects will be present when comparing results within cuts **from any one carcass***

All positions tested in all cooking styles



Product Sample Preparation in Tokyo



Sample Presentation to Consumers

- Every consumer served a total of 7 samples
- The first sample always a mid quality starter product
- The 6 test products drawn from 6 of the 9 product groups
- The product order balanced by using a latin square
- Cooking methods followed rigorous protocols
- Product ID set and controlled by software

not used within the analysis of following samples

(3 marbling levels within 3 cuts)

Ensures each product is served equally in each position and before & after each other product

Latin Square Presentation

Common Link Product

1	2	3	4	5	6
2	4	1	6	3	5
3	1	5	2	6	4
4	6	2	5	1	3
5	3	6	1	4	2
6	5	4	3	2	1

Sensory Product Selection

- Each consumer was served 6 products from a possible 9 (9 products resulted from 3 marbling levels in 3 cuts)
- The 6 products to each consumer always included 2 marbling levels from each of the 3 cuts
- Therefore every consumer tested 2 chucks, 2 outside flats & 2 striploins

Product Cooking & Serving



Australian Sensory Design

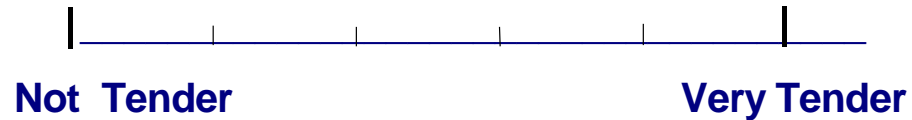
Sample	Outside Flat			Chuck			Striploin		
	Mb Range	<400	400-800	>800	<400	400-800	>800	<400	400-800
1	AUSTRALIAN PRODUCT PAIRED IN JAPAN								
2									
3	OTHER AUSTRALIAN PRODUCT								
4									
5									
6									

Japanese Sensory Design

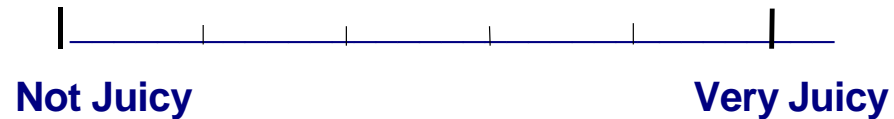
Sample	Outside Flat			Chuck			Striploin		
	Mb Range	<400	400-800	>800	<400	400-800	>800	<400	400-800
1	JAPANESE PRODUCT								
2	PAIRED AUSTRALIAN PRODUCT								
3									
4									
5									
6									

Score Sheet

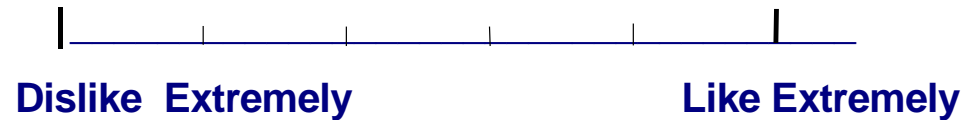
Tenderness



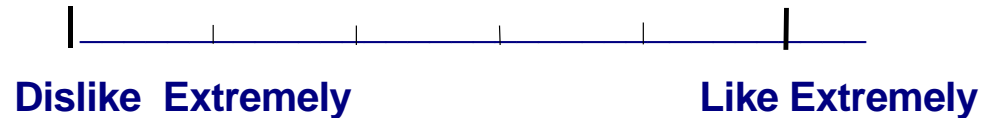
Juiciness



Liking of flavour



Overall Liking



Score Sheet

Please tick ✓ one of the following to rate the quality of the beef sample you have just eaten

Choose **one** only (you must make a choice).

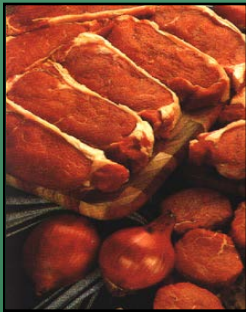
Unsatisfactory

Good everyday quality

Better than everyday quality

Premium quality

Design Issues

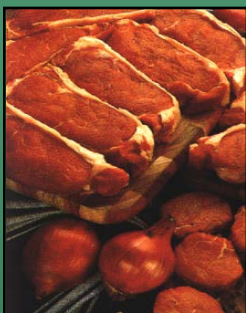


Australian Data Points

- 5400 test samples paired to Japanese consumers plus first position links
- 180 cuts paired to Japanese consumers (3 cooking styles within each cut)
- 87 cattle paired to Japanese consumers with cuts from 138 tested in Australia
- Product linkage to USA & Irish trials

Tested in conjunction with samples from other MSA trials to provide data linkage to 58,000 cuts tested

Design Issues



Japanese Data Points

- 1620 consumers in segmentation study
- 180 trade night consumers
- 12,600 samples
- 4 sensory scales plus category for each
- 10 consumers per sample – 1,260 cuts
- Source cattle – 87 ex Australia, Japan 36

How do Japanese consumers evaluate beef when eaten cooked?

- Relative importance of tenderness, flavour, juiciness?
- Cut-off points to separate grades?
- Differences between cooking methods?
- Differences between cities, sexes, age groups?
- Comparison to Australian consumers.

% Samples by Grade

	Fail	3*	4*	5*
Grill	40%	37%	16%	7%
Yakiniku	32%	41%	20%	7%
Shabu Shabu	30%	40%	21%	9%
ALL	34%	39%	19%	8%

Current Australian Weightings

Tenderness X 0.4

+

Juiciness X 0.1

+

Flavour X 0.2

+

Overall Liking X 0.3

MQ4 score



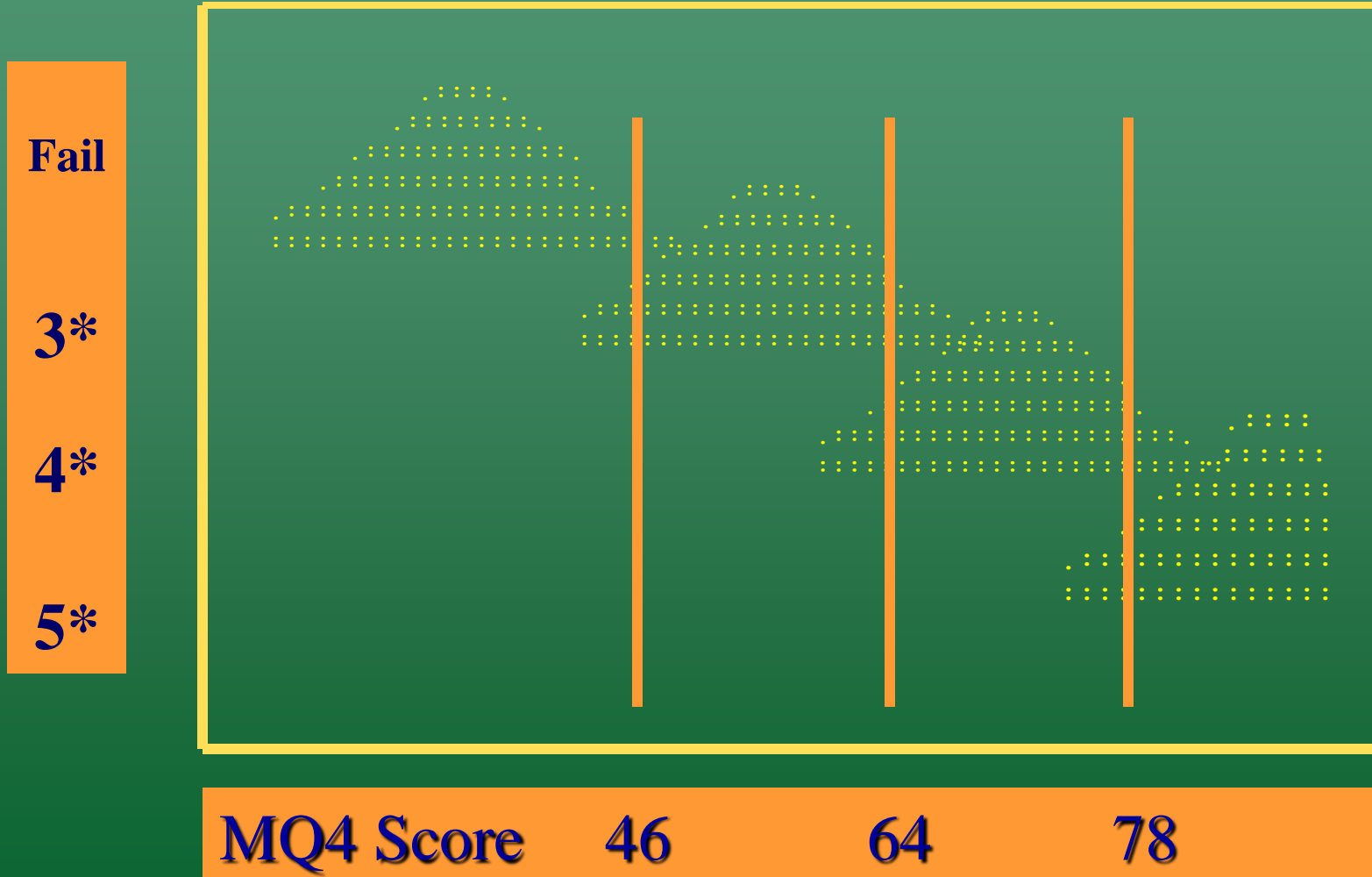
Optimum Weightings x Scale & Cook

	Grill	Yakiniku	Shabu	Average
Tender	0.30	0.25	0.16	0.24
Juicy	0.20	0.06	0.20	0.15
Flavour	0.24	0.41	0.40	0.35
Overall	0.26	0.28	0.24	0.26

Tokyo 3 Scale Weightings (Overall Removed)

	Grill	Yakiniku	Shabu
Tender	34%	33%	21%
Juicy	25%	3%	19%
Flavour	41%	63%	60%

Australian MSA Grade Boundaries



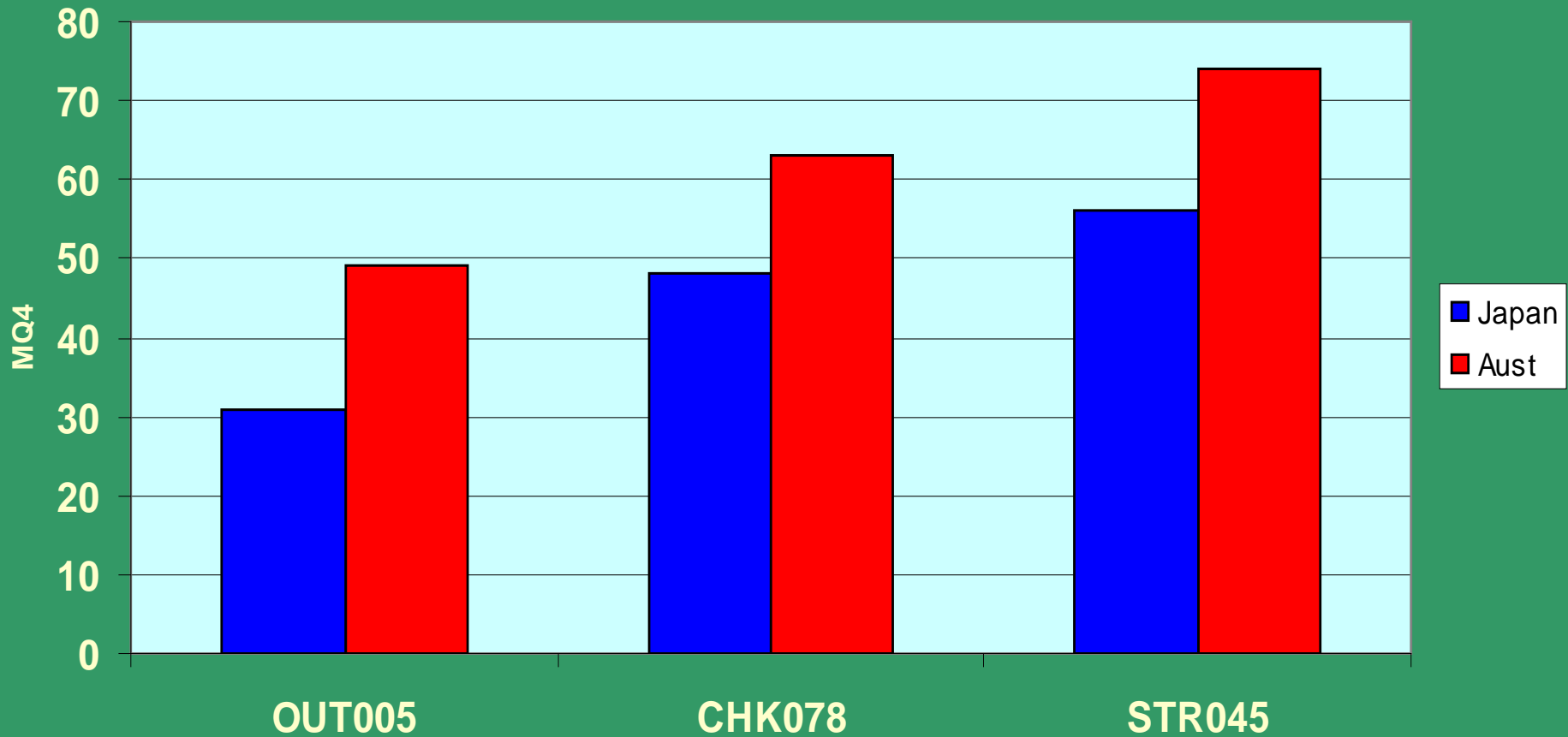
Japanese Cut-Off Scores By City (MQ4)

	FAIL / 3*	3 / 4*	4 / 5*
GRILL			
Tokyo	40.9	66.7	82.3
Osaka	41.8	69	85
YAKINIKU			
Tokyo	43.4	69.3	84
Osaka	43	68.9	84.4
SHABU			
Tokyo	43.1	67.6	83.4
Osaka	44.6	68.3	83.8
Std MSA	46.5	64	77.5

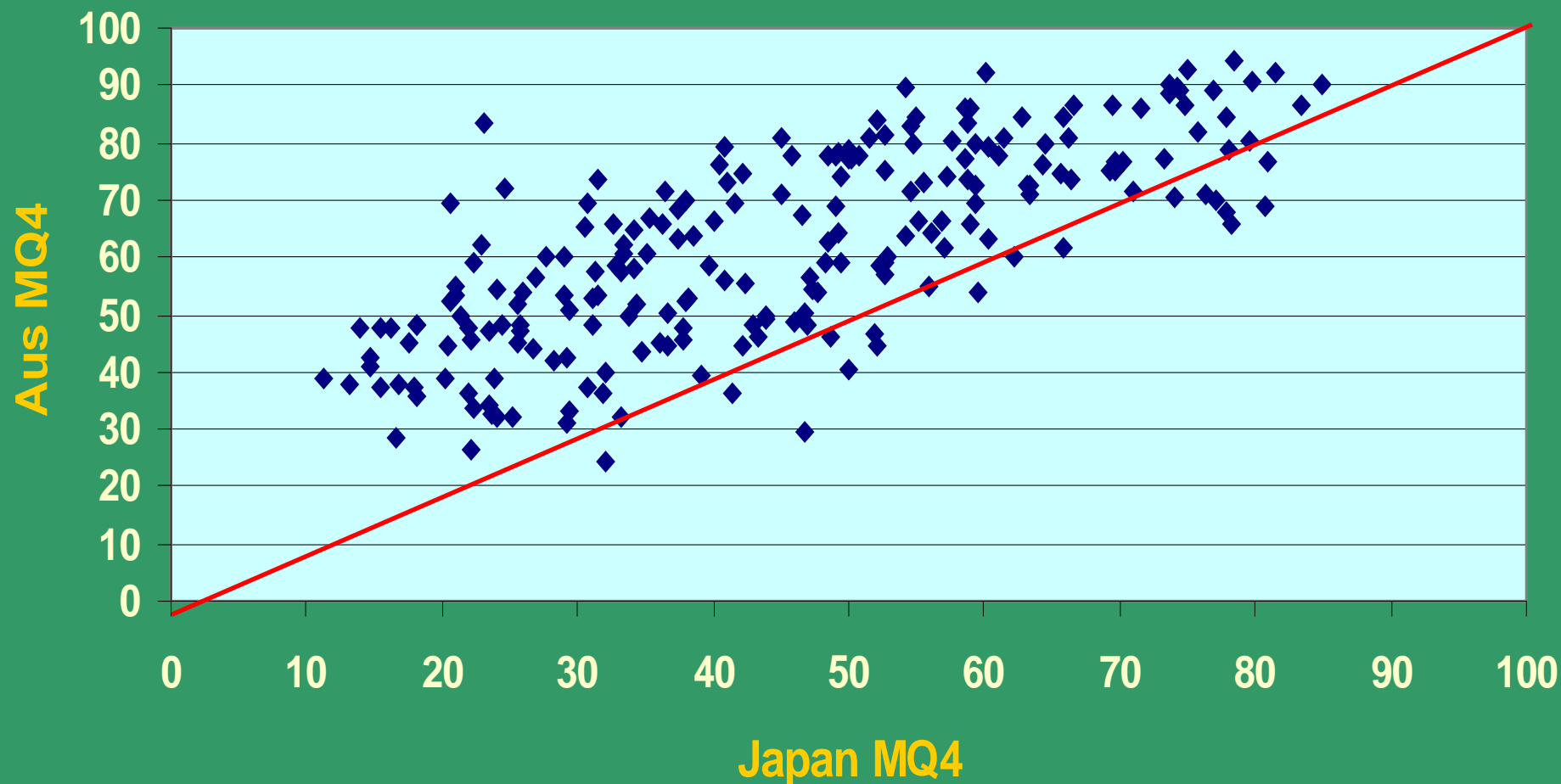
How did the beef eat?

- Japanese & Australian consumer scores for Australian Product
- How do Australian and Japanese consumers scores compare?
- Japanese consumer scores for Japanese product

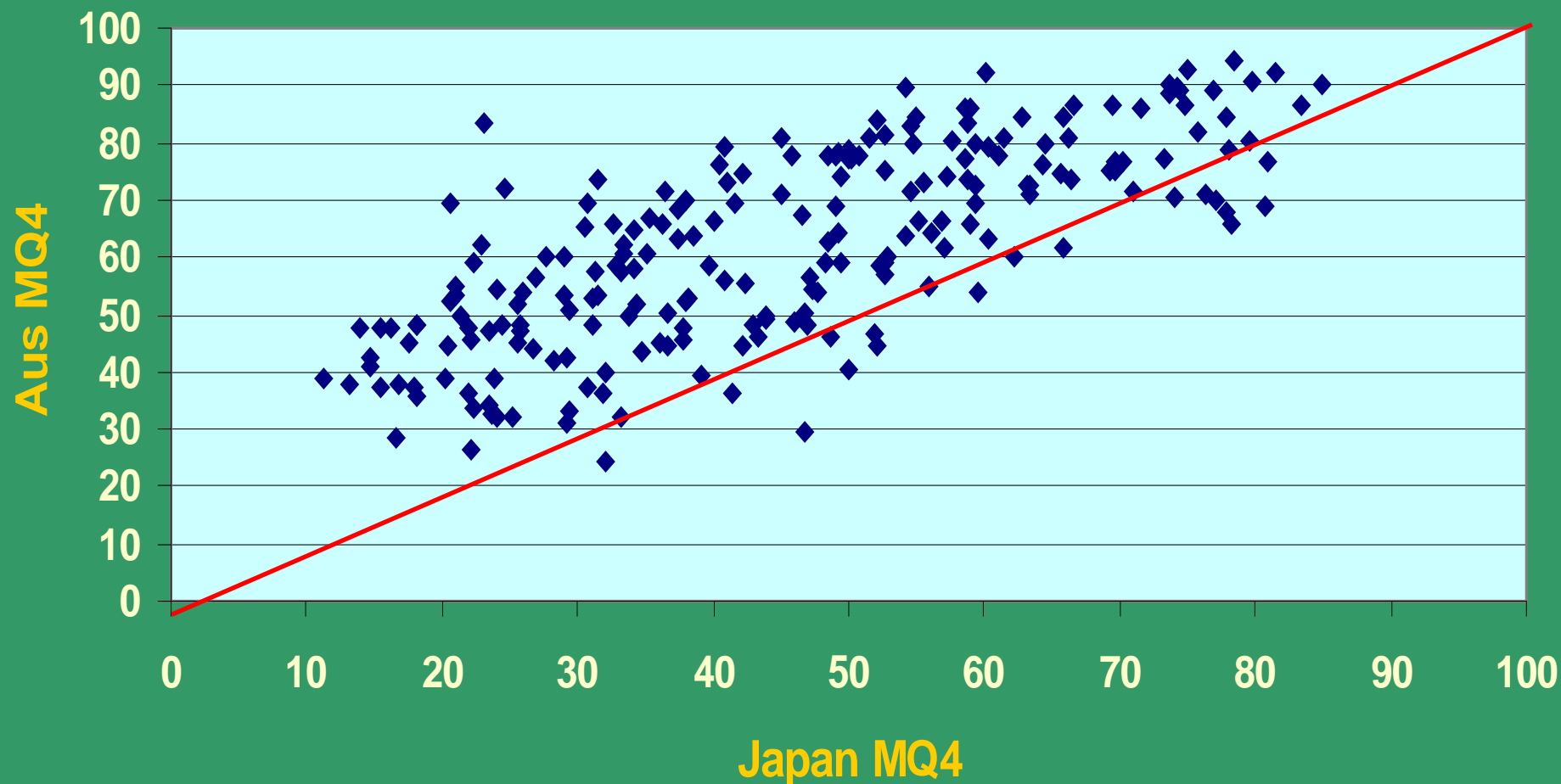
Comparison of Australian & Japanese MQ4 Scores by Cut GRILLS



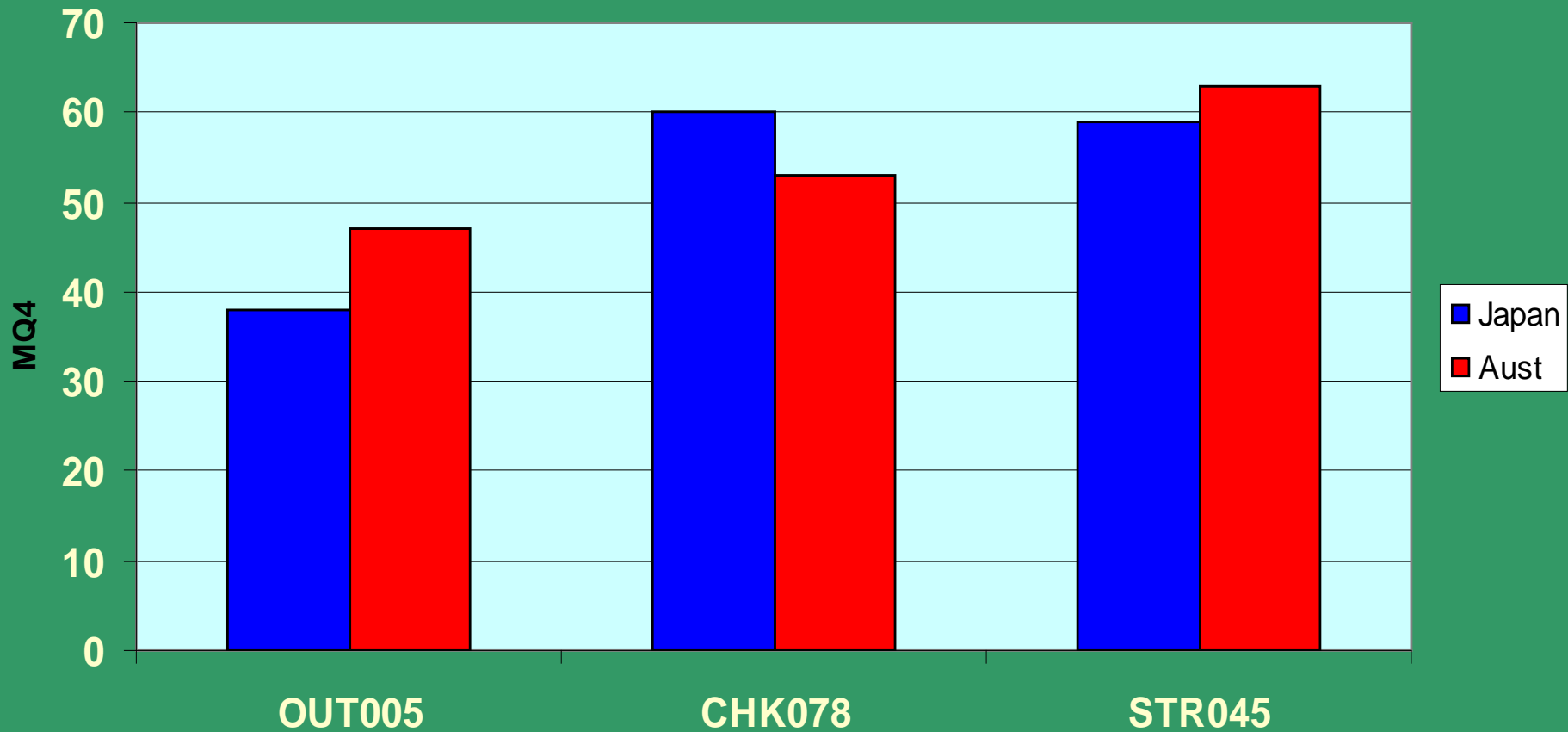
Australian vs Japanese MQ4 for Grills (All Cuts)



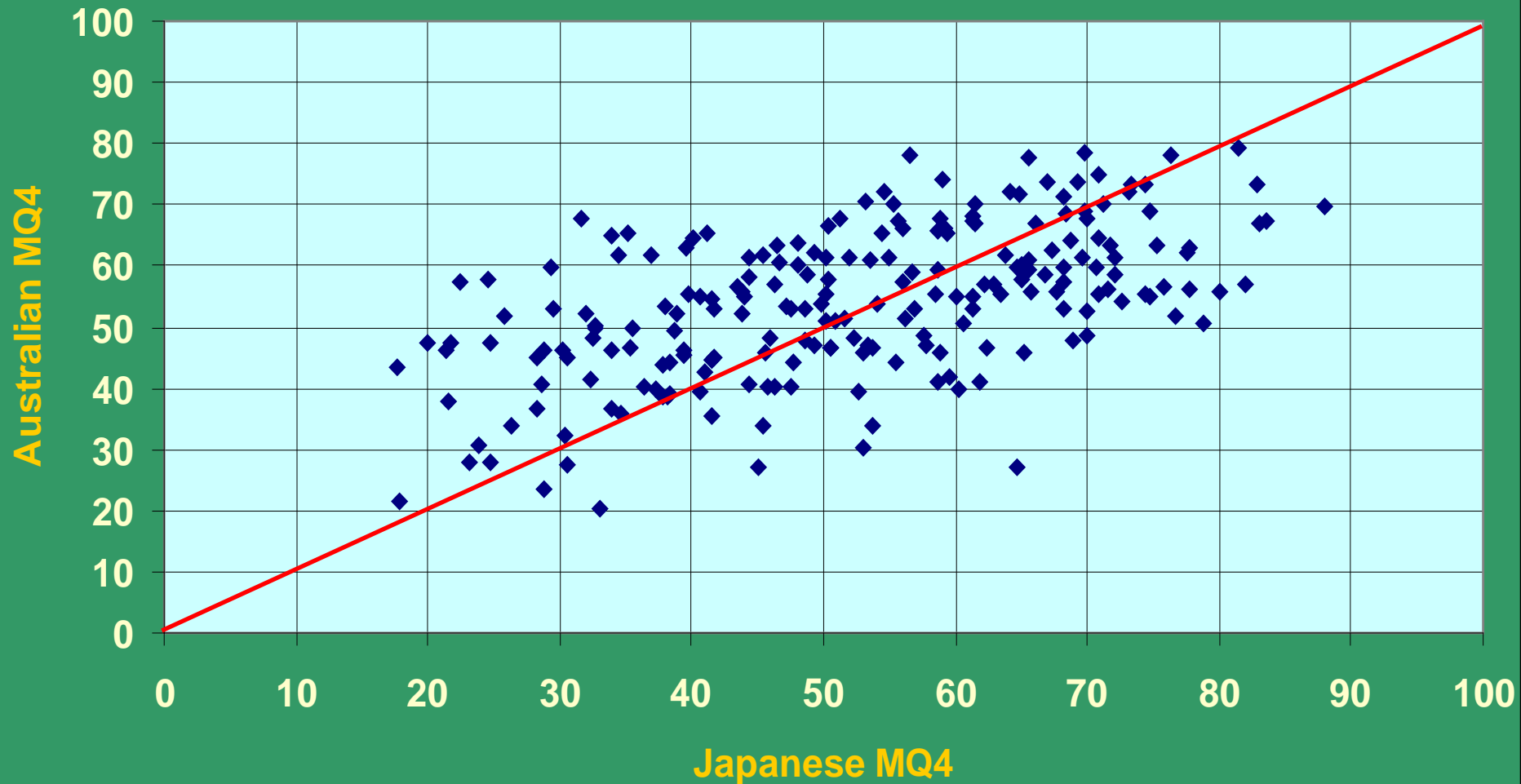
Australian vs Japanese MQ4 for Grills (All Cuts)



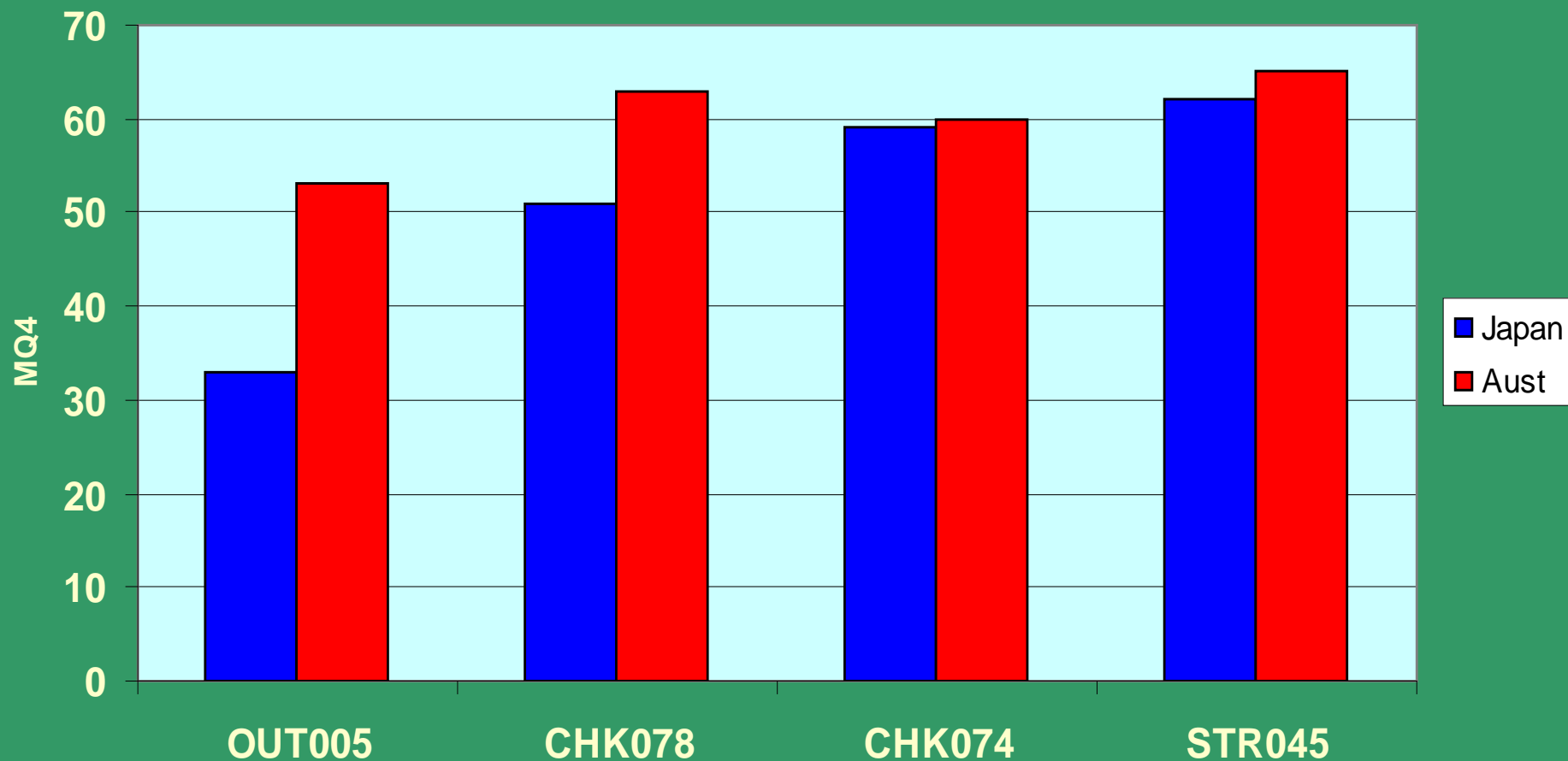
Comparison of Australian & Japanese MQ4 Scores by Cut Shabu Shabu



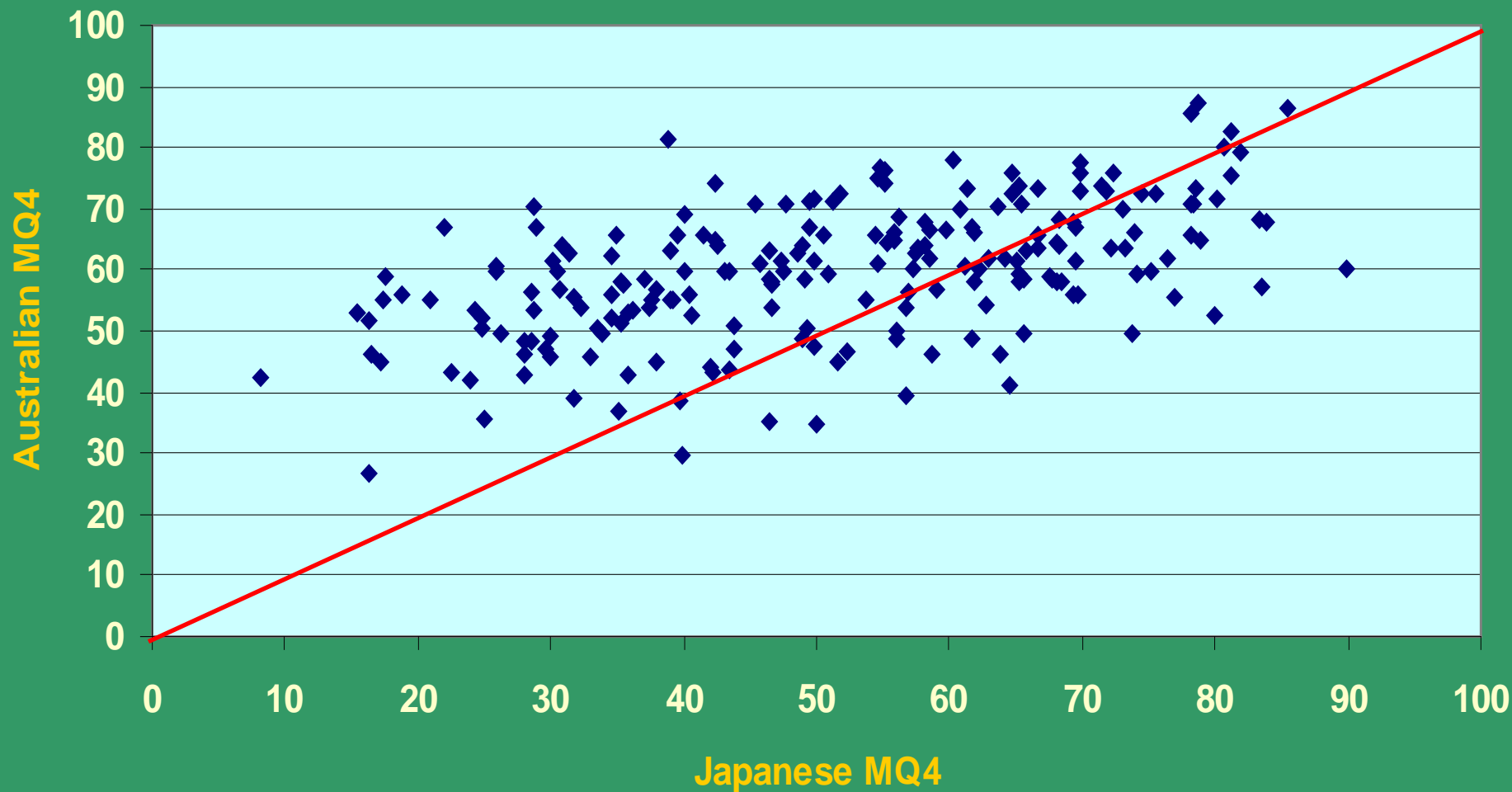
All Cuts Shabu Shabu - Australian vs Japanese MQ4



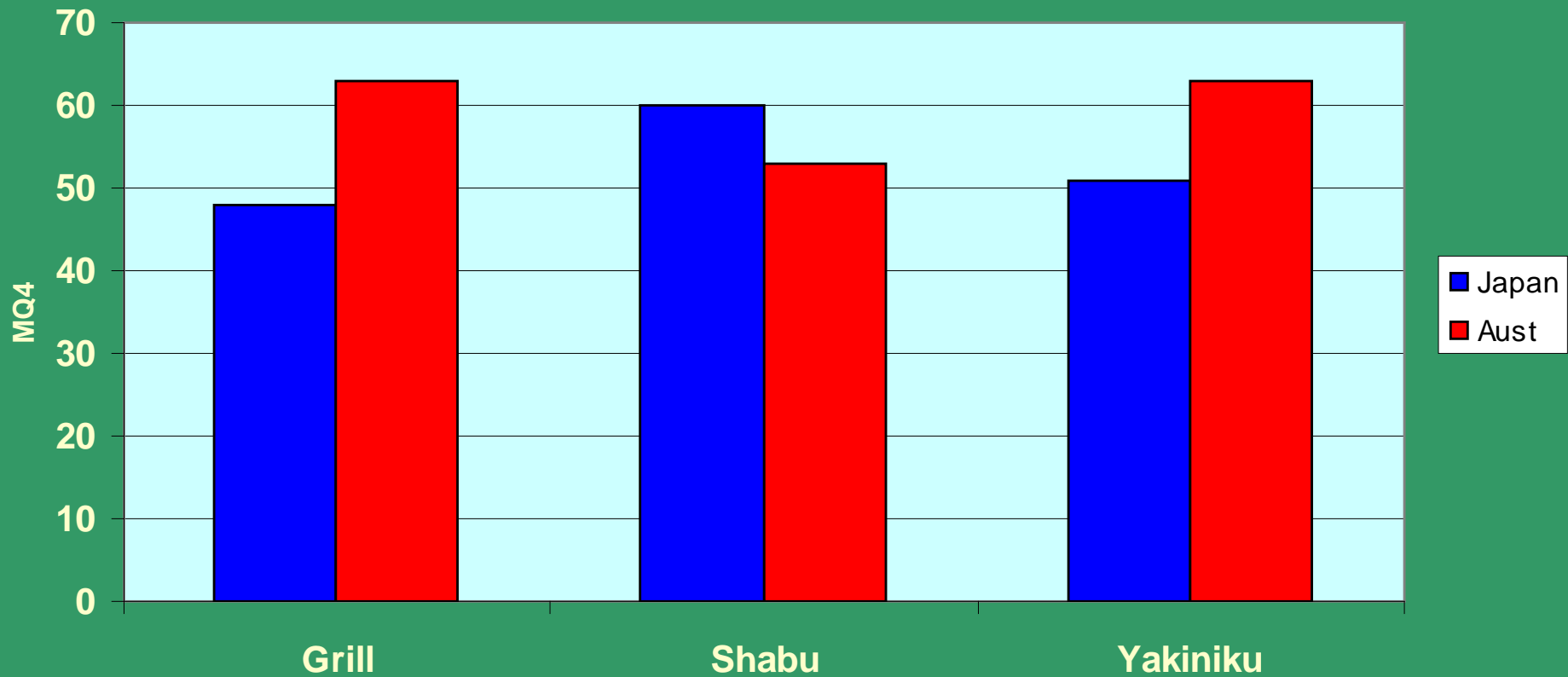
Comparison of Australian & Japanese MQ4 Scores by Cut Yakiniku



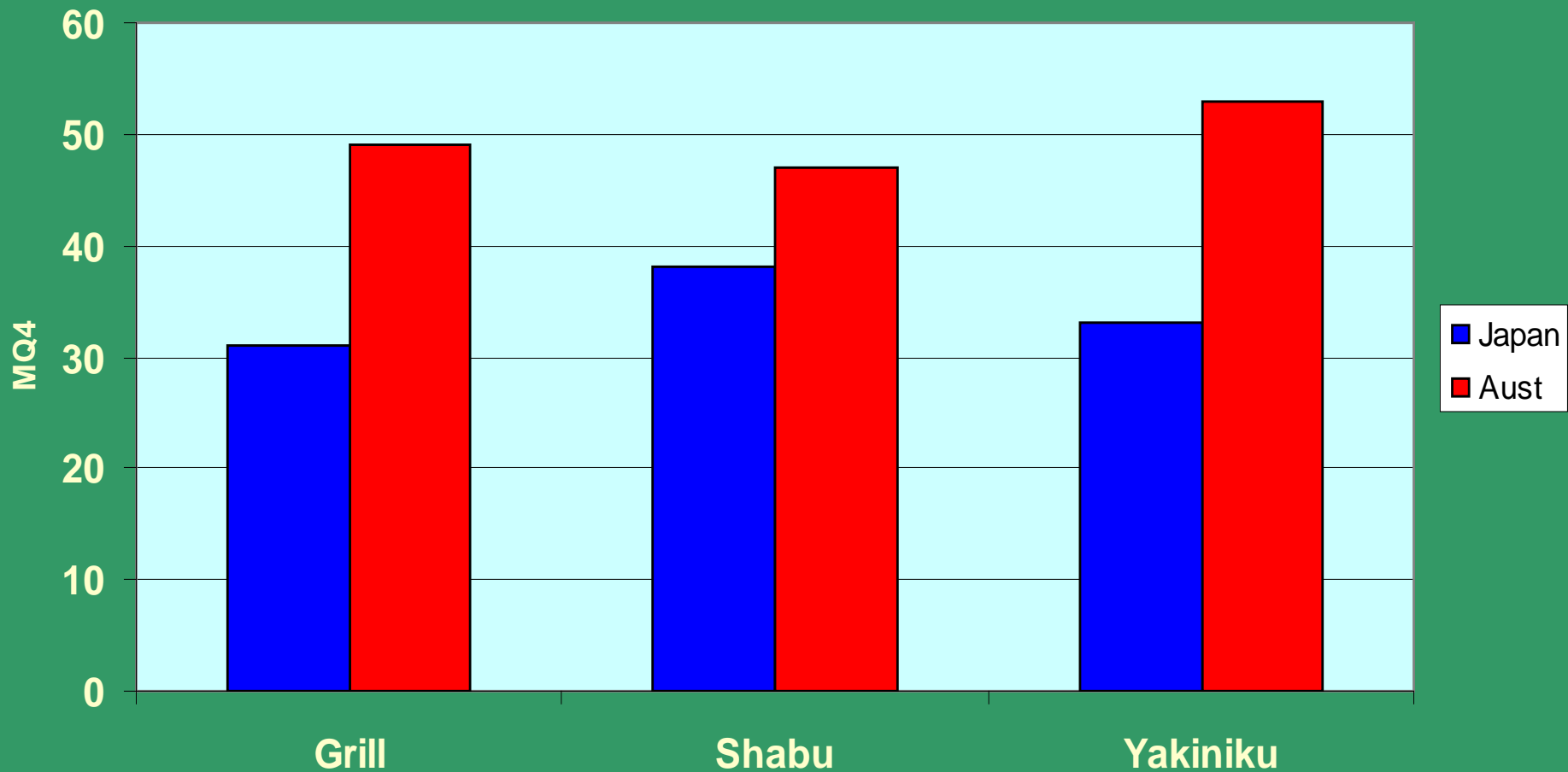
All Cuts Yakiniku - Australian vs Japanese Consumers



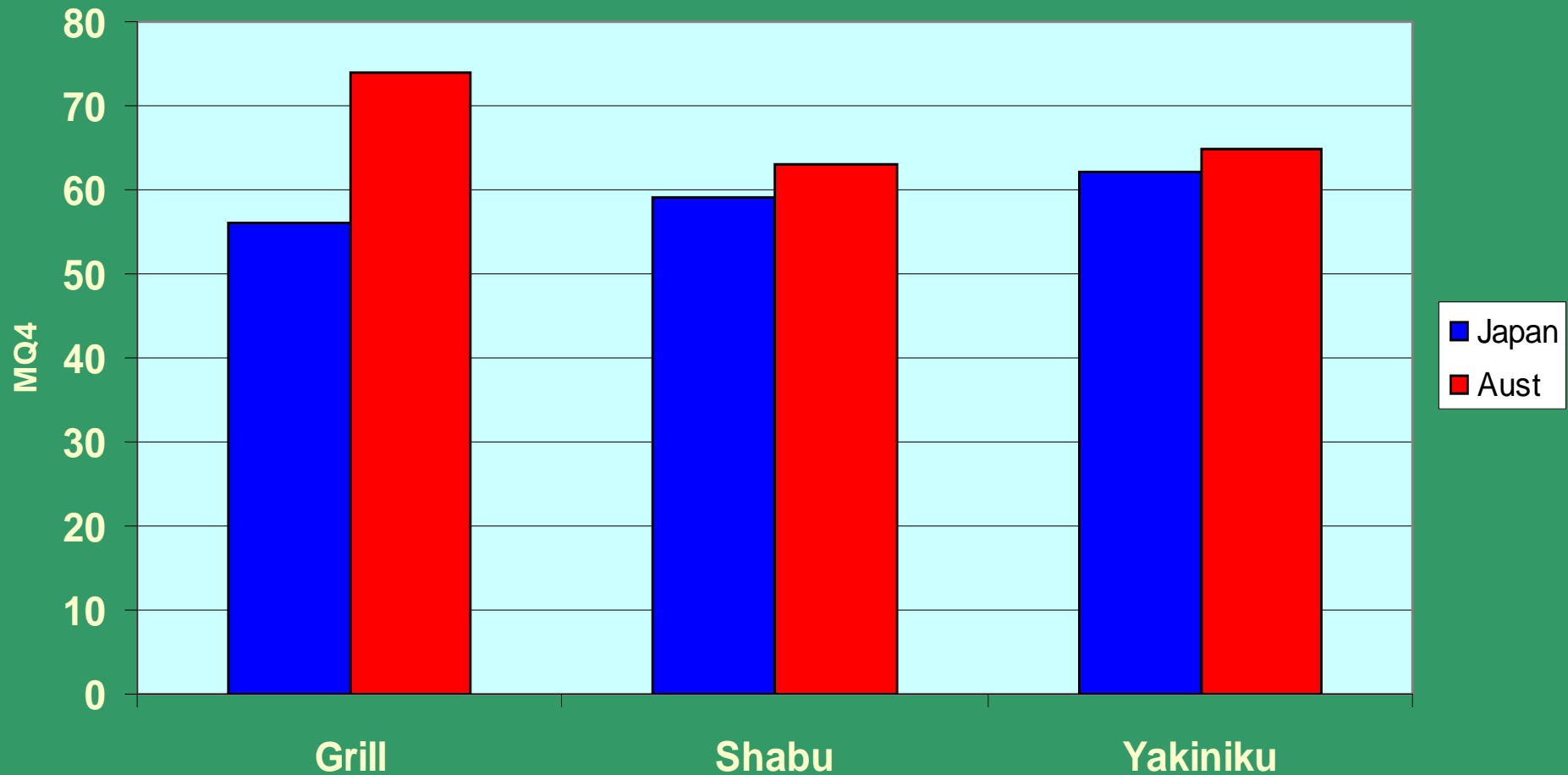
Comparison of Australian & Japanese MQ4 Score by Cooking Method - CHK078



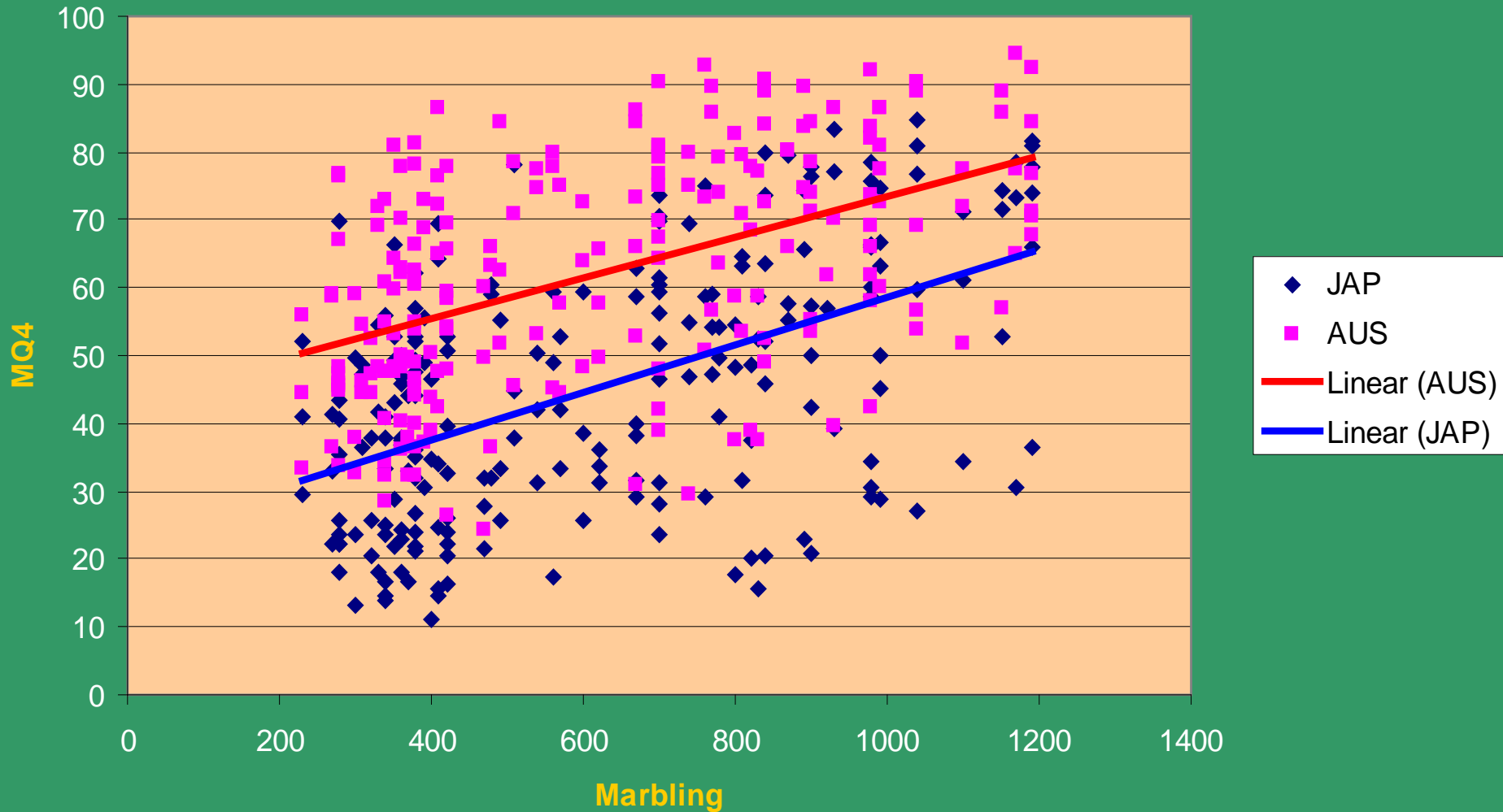
Country Comparison by Comparison of Australian & Japanese MQ4 Score by Cooking Method - OUT005



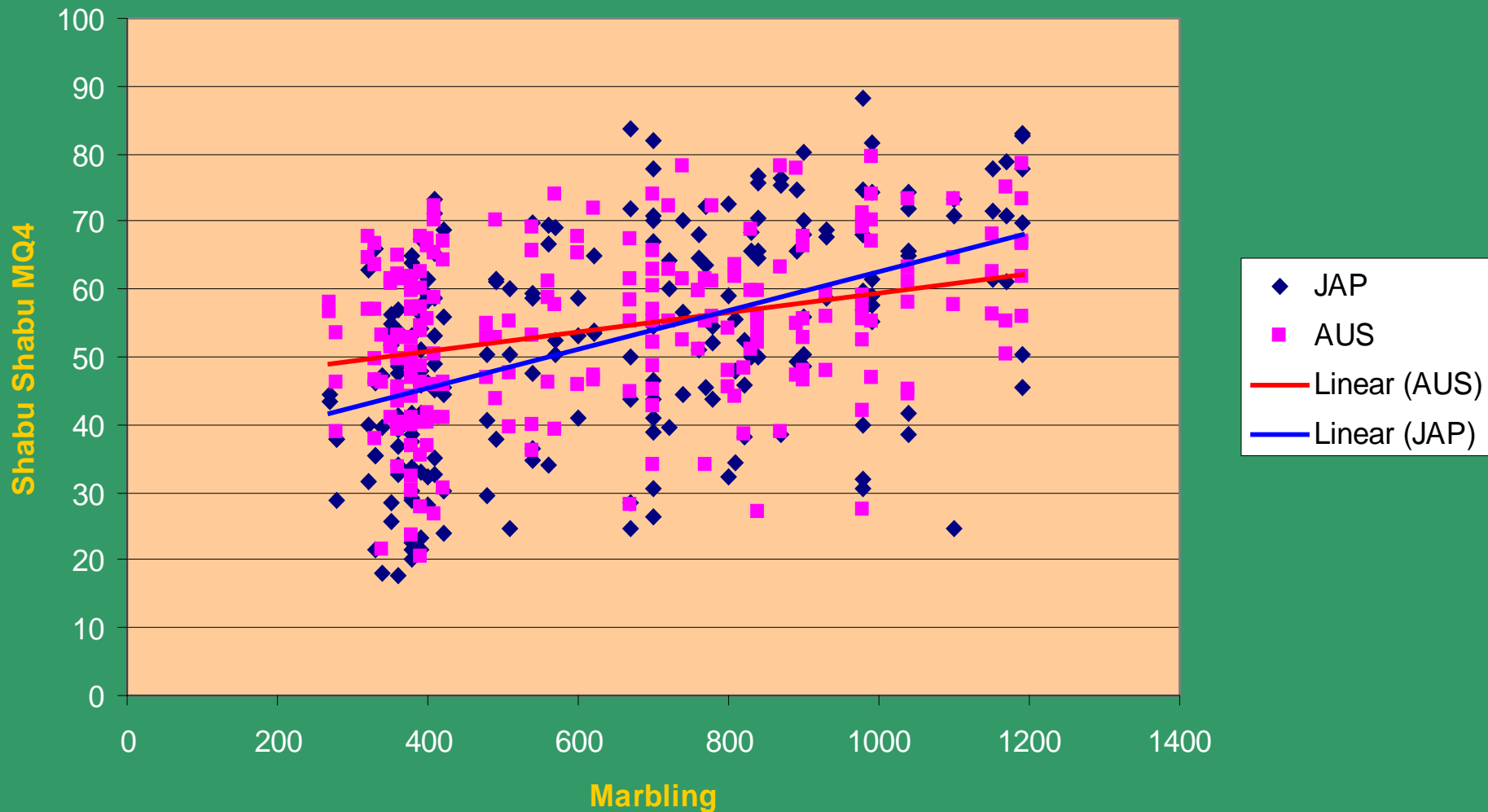
Comparison of Australian & Japanese MQ4 Score by Cooking Method STR045



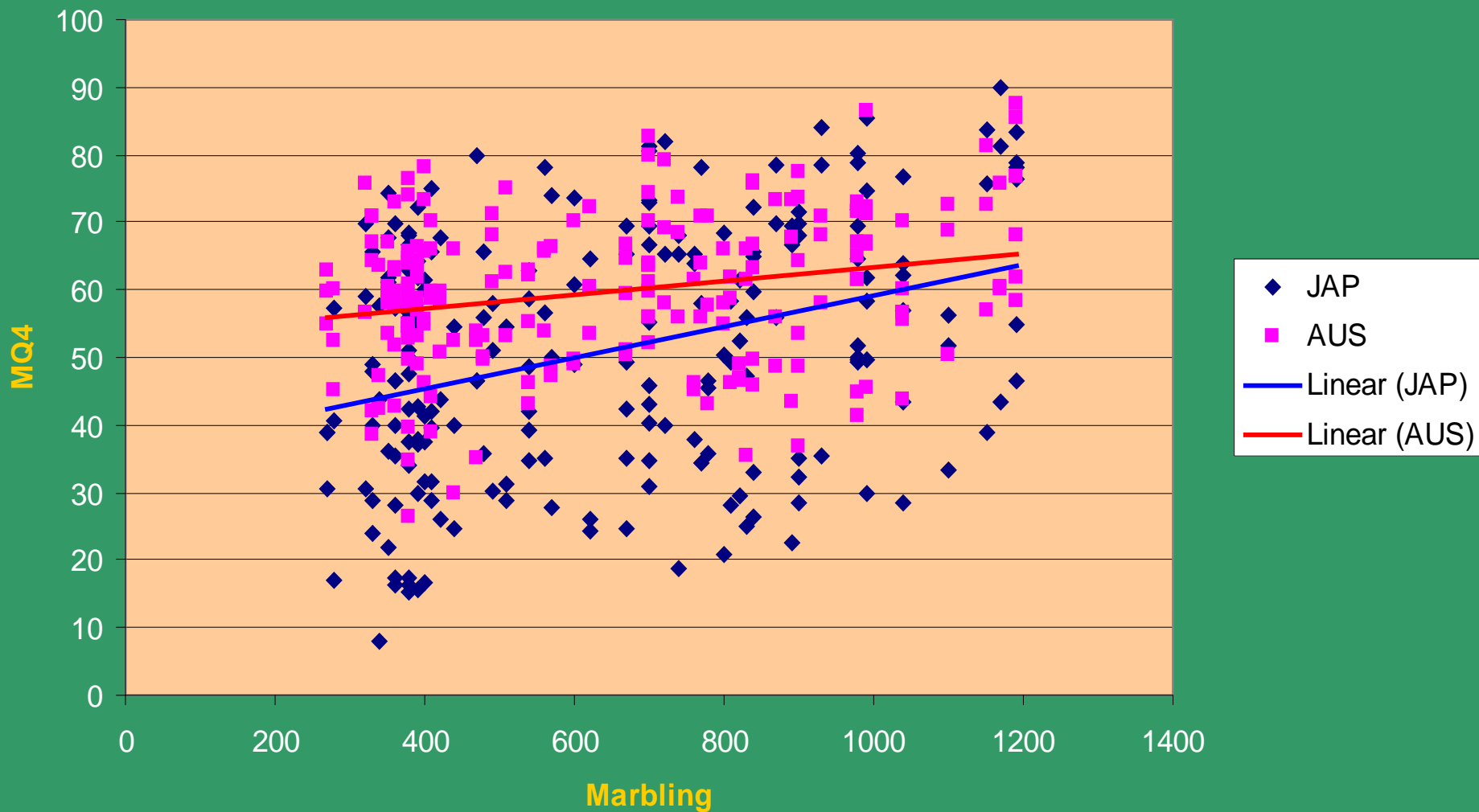
ALL GRILLS - Australian & Japanese MQ4 vs Marbling



ALL CUTS Shabu Shabu - Australian & Japanese MQ4 vs Marbling



ALL CUTS Yakiniku - Australian & Japanese MQ4 vs Marbling



MQ4 by Breed & Feed Type - Striploin

	<i>n</i>	GRILL		SHABU		YAKINIKU	
		Aust	Japan	Aust	Japan	Aust	Japan
Wagyu	3	85	76	71	71	81	78
F1 Wagyu	20	85	68	67	68	68	69
Wagyu x Santa	6	81	56	65	60	70	62
British Longfed	18	79	66	60	59	66	62
British Shortfed	11	67	51	61	62	62	62
British Grass (EU)	22	68	46	59	51	63	55
Bos-Indicus Grass	7	49	31	62	43	51	62

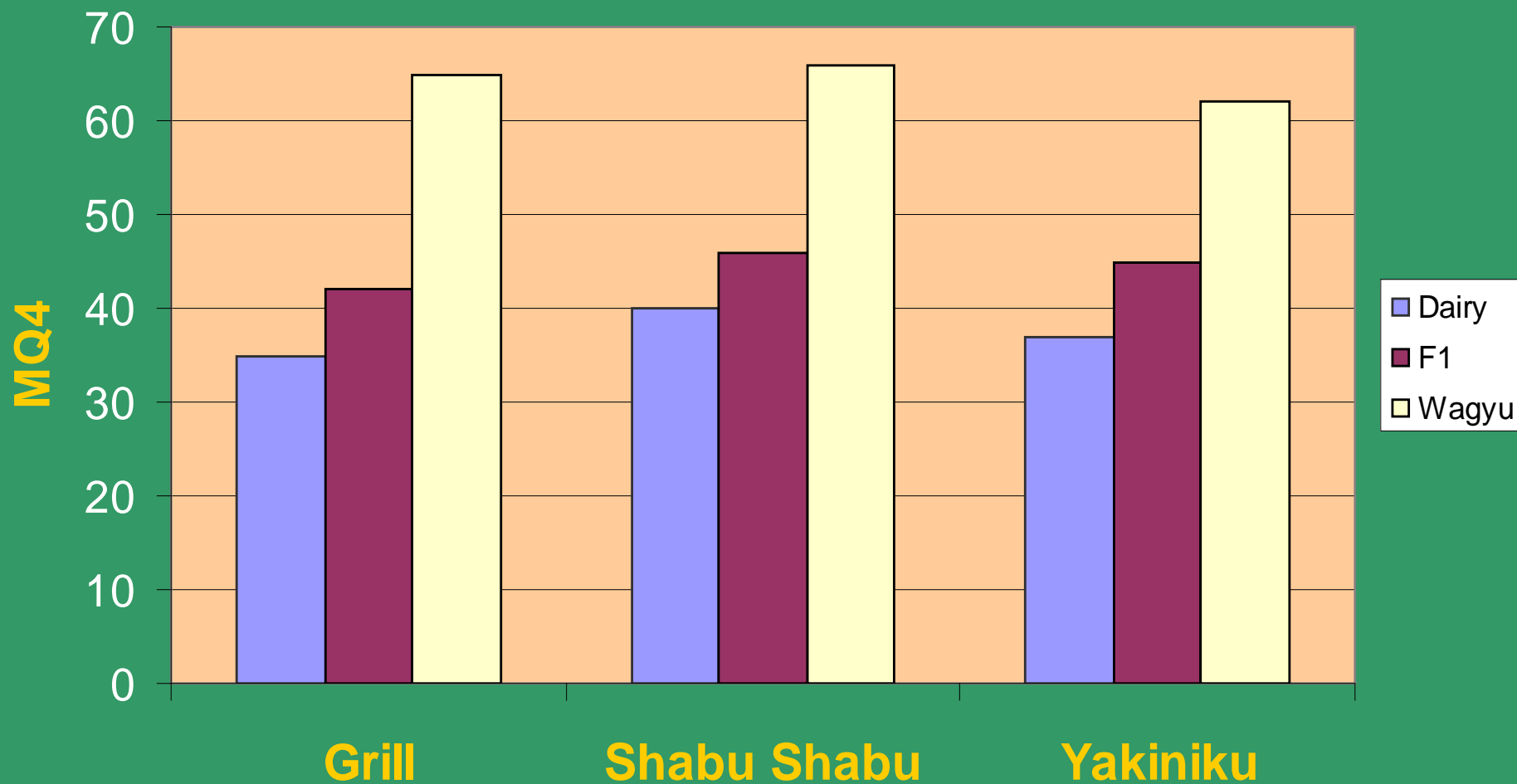
MQ4 by Breed & Feed Type – Chuck

	<i>n</i>	GRILL		SHABU		YAKINIKU	
		Aust	Japan	Aust	Japan	Aust	Japan
Wagyu	3	74	70	56	77	57	84
F1 Wagyu	20	74	65	61	70	62	69
Wagyu x Santa	6	70	59	58	71	60	47
British Longfed	18	70	52	50	59	60	60
British Shortfed	11	50	37	51	48	59	59
British Grass (EU)	22	55	31	46	49	60	53
Bos-Indicus Grass	7	56	32	46	50	60	48

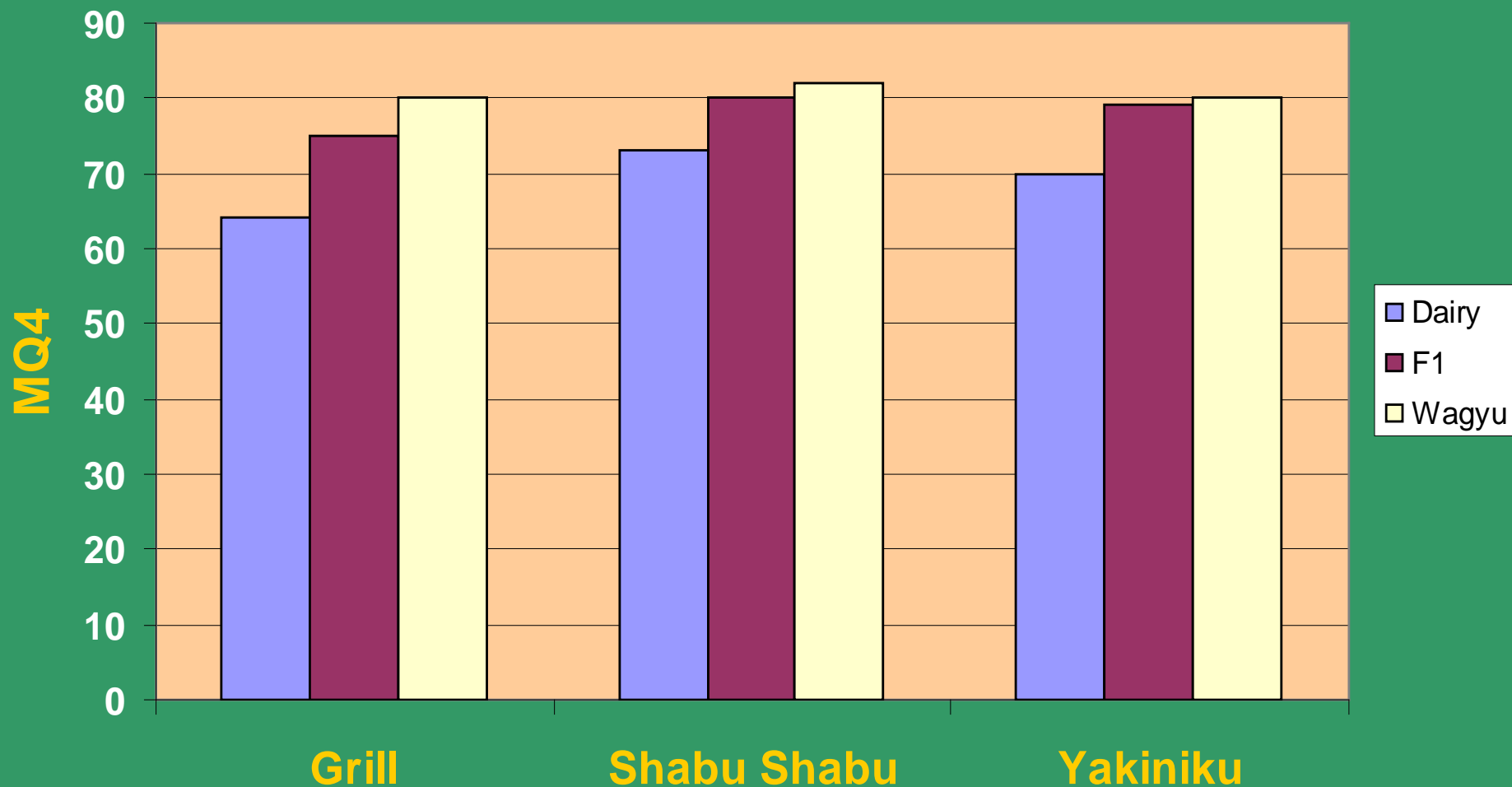
MQ4 by Breed & Feed Type – Outside Flat

	<i>n</i>	GRILL		SHABU		YAKINIKU	
		Aust	Japan	Aust	Japan	Aust	Japan
Wagyu	3	70	47	61	50	73	46
F1 Wagyu	20	61	42	48	40	55	42
Wagyu x Santa	6	44	31	47	41	46	30
British Longfed	18	48	34	45	40	53	33
British Shortfed	11	44	32	56	39	53	31
British Grass (EU)	22	43	28	41	29	52	23
Bos-Indicus Grass	7	31	25	45	28	42	33

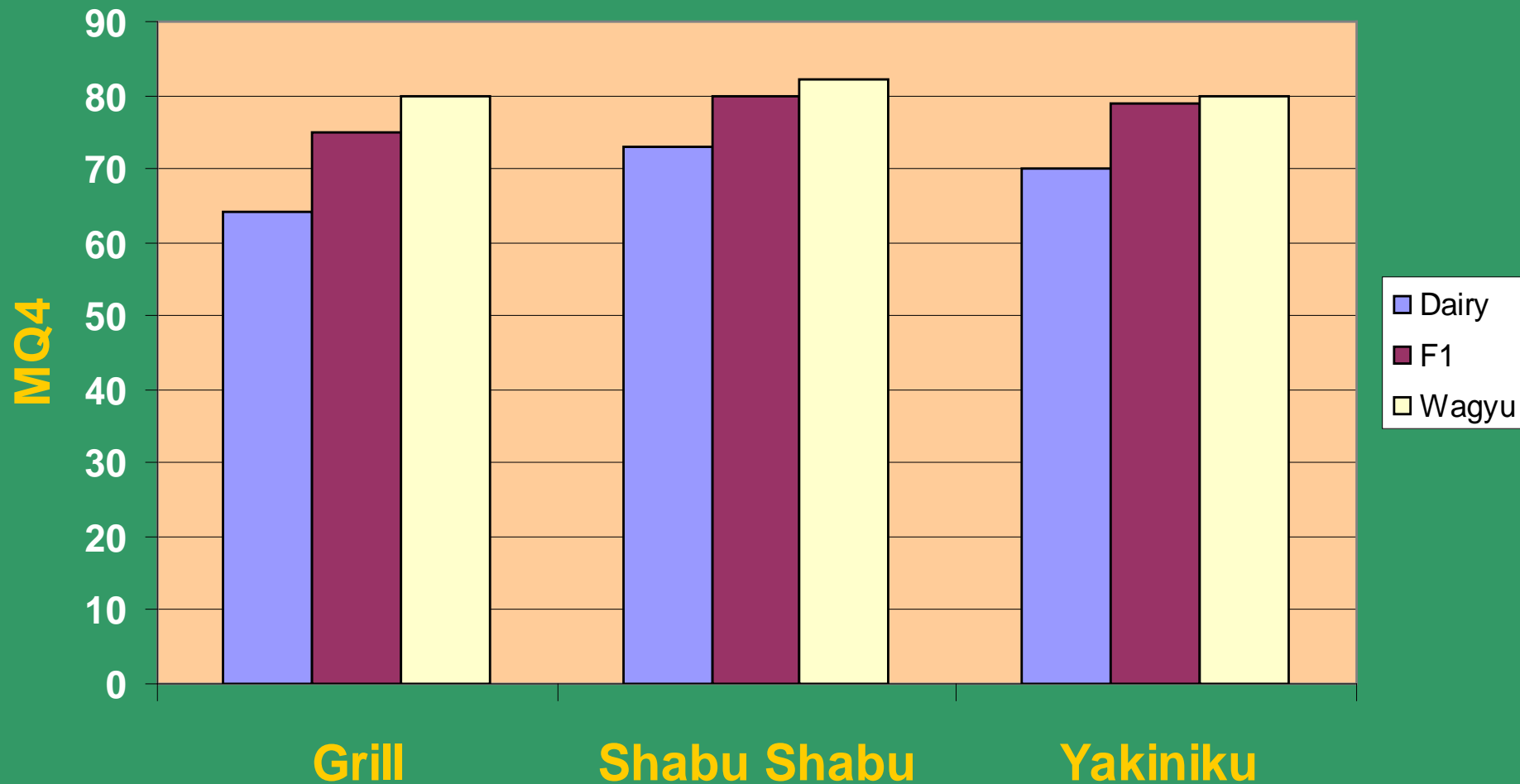
Japanese Cattle - Cut x Cook - OUT005



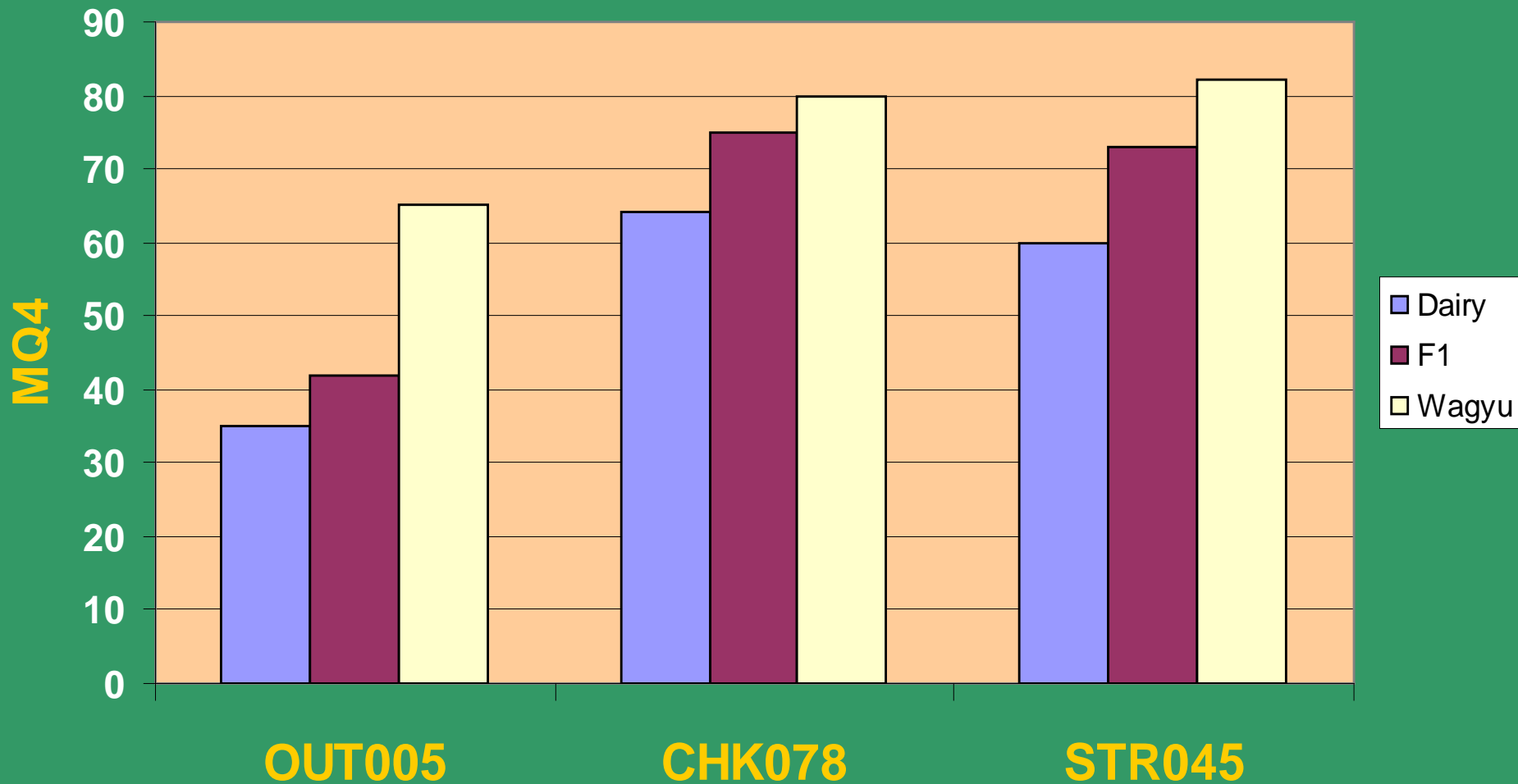
Japanese Cattle - Cut x Cook - CHK078



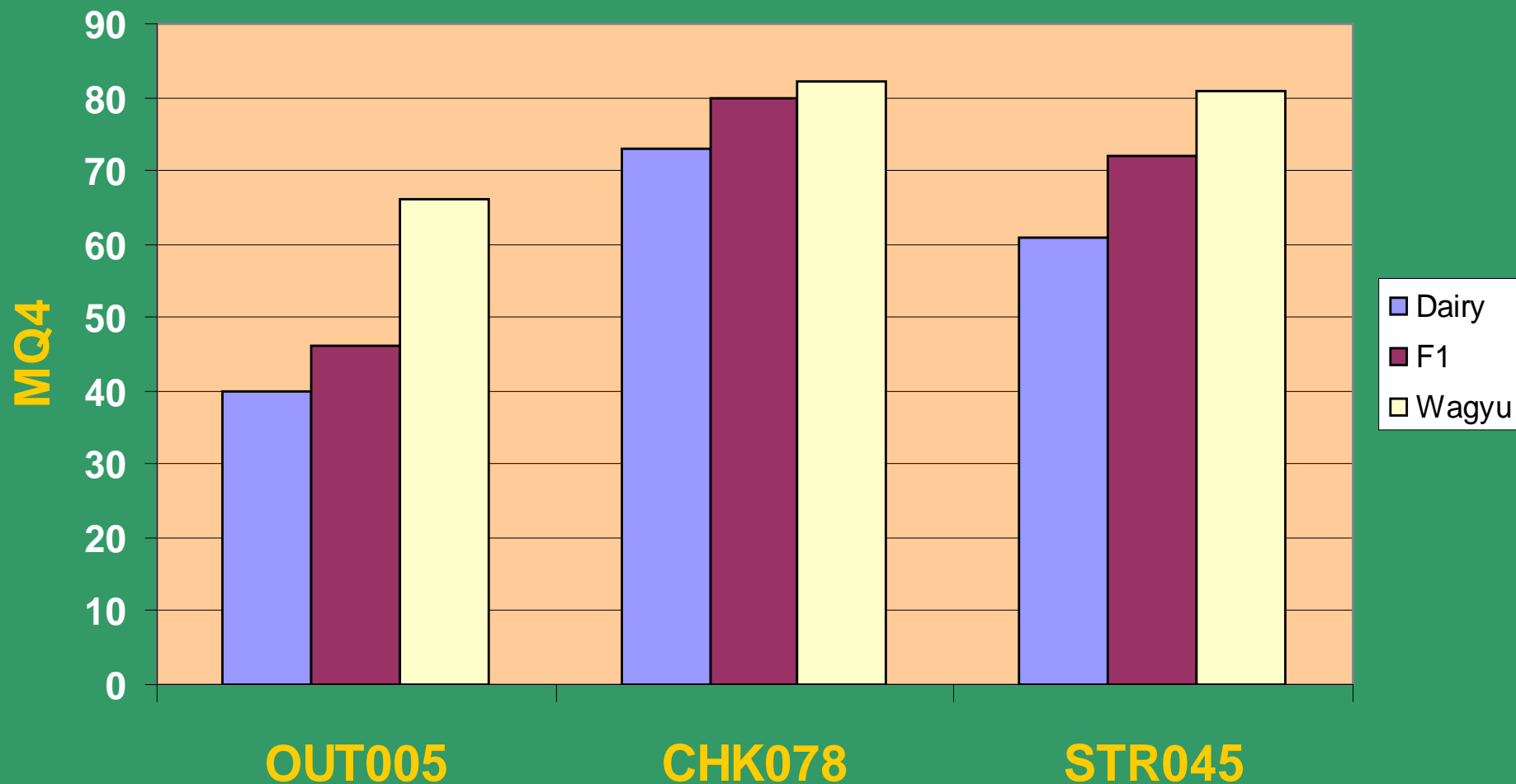
Japanese Cattle - Cut x Cook - STR045



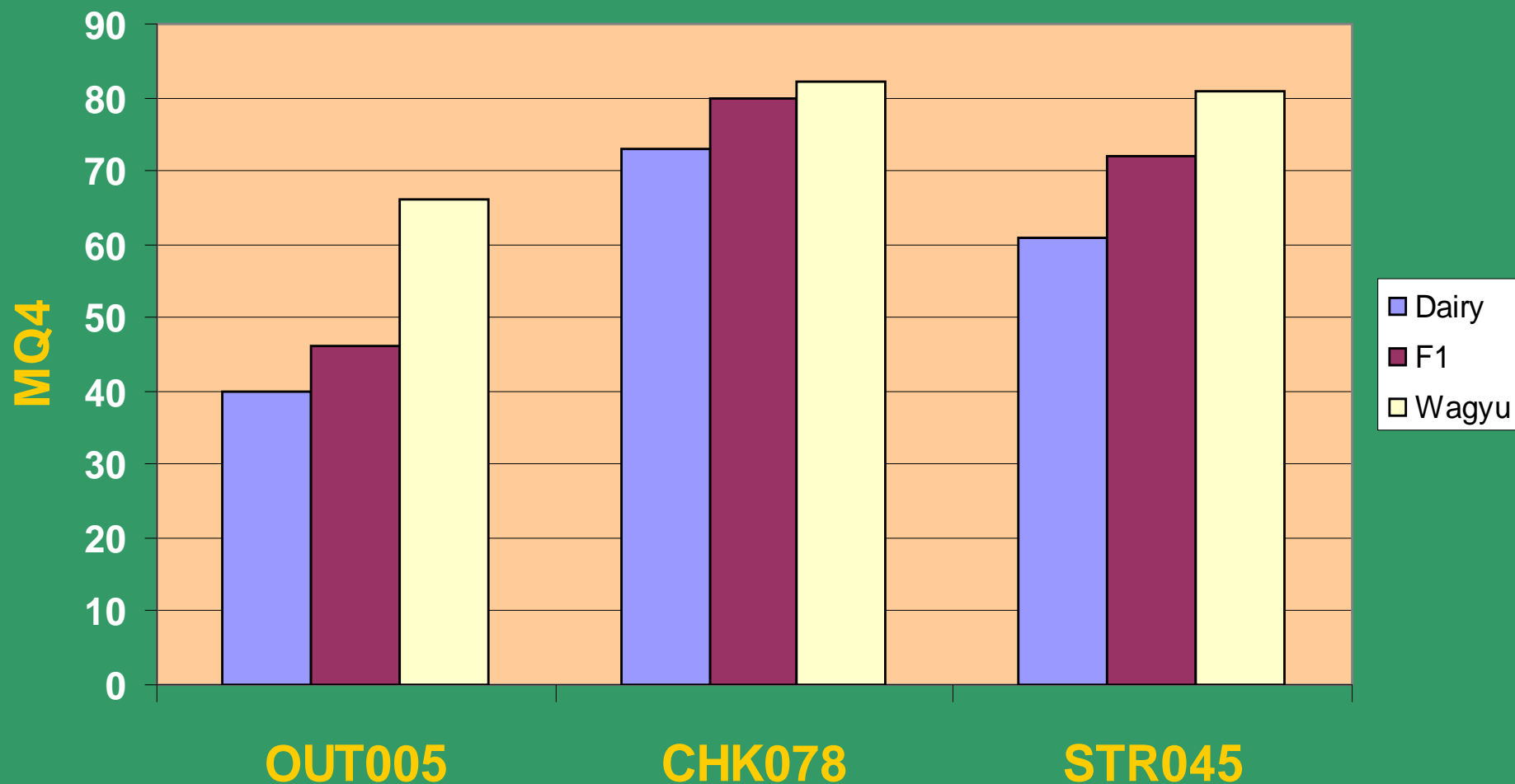
Japanese Cattle - Grill MQ4 by Cut



Japanese Cattle - Shabu Shabu MQ4 by Cut



Japanese Cattle - Yakiniku MQ4 by Cut



Conclusions - Japanese Consumer Evaluation

- Japanese consumers clearly identify eating quality differences.
- Weightings are more influenced by flavour
- Grade cut-off scores very similar to Australia
- Actual scores much lower on grills, and more so at low quality levels
- No difference between cities or within demographics

Suggested follow up work

- Trial 12 mm steak compared to 25mm in Japan
- Consider adjusting weightings in conjunction with USA, Irish, Korean and recent Australian data

Conclusions regarding eating quality performance

- Japanese consumers tend to score below Australian
- Difference is greatest on low quality cuts
- Difference is greater for grills
- Wagyu scored high but also more marbled
- Scores increase with marbling but wide variance within

Suggested follow up

- Adjust MSA model for high marbling levels
- Evaluate need for additional Wagyu % input
- Adjust Yakiniku estimates in model
- Add Shabu–Shabu estimate
- Compare new model output to trial results for Japanese, USA, Irish and Australian consumers
- Evaluate need for any country specific adjustment to model output
- Further evaluate grass versus grainfed results adjusted for other inputs

Satisfaction and Price

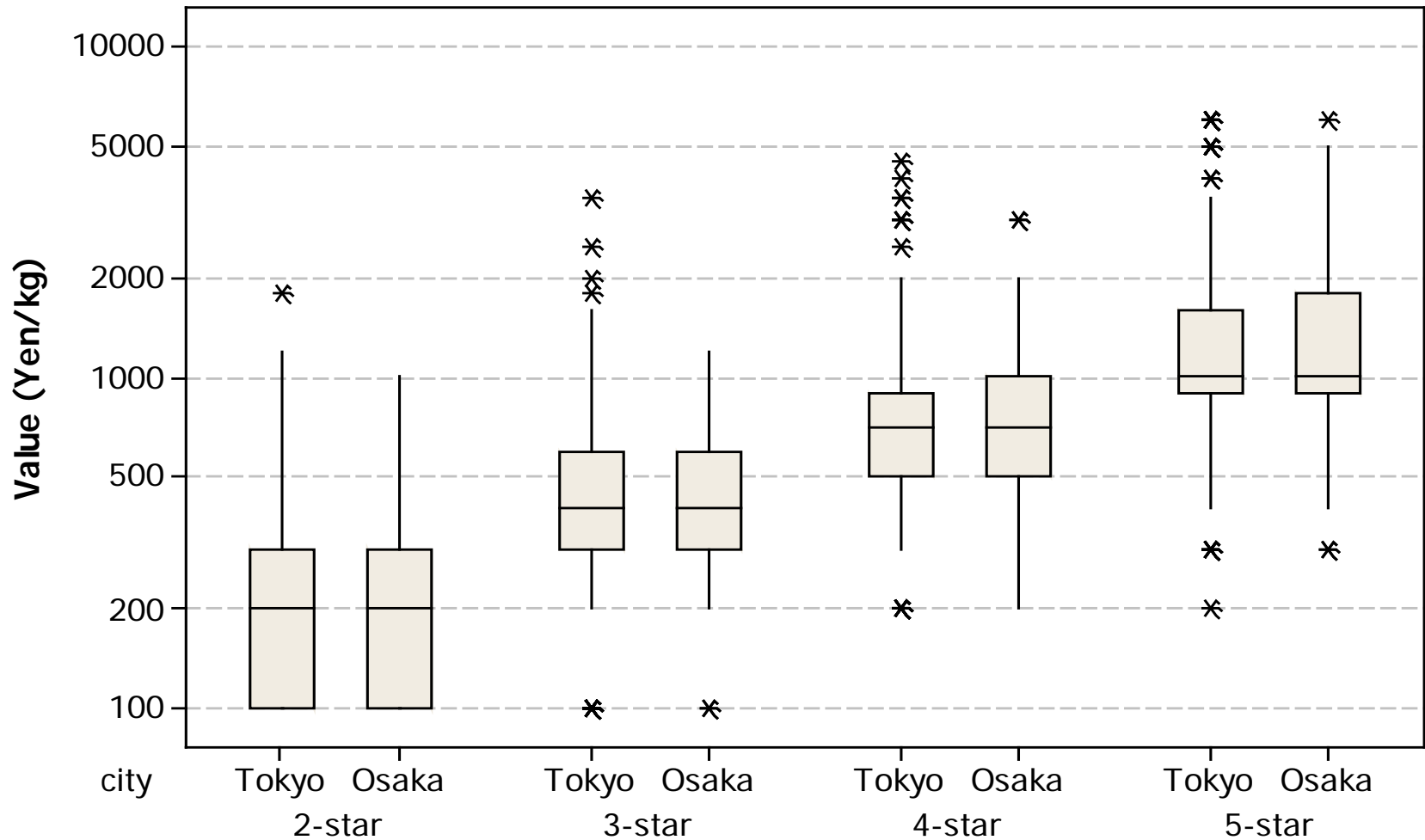
- Price indications for quality levels
- Price perception between cities

Issues addressed in conjunction with segmentation study by Synovate

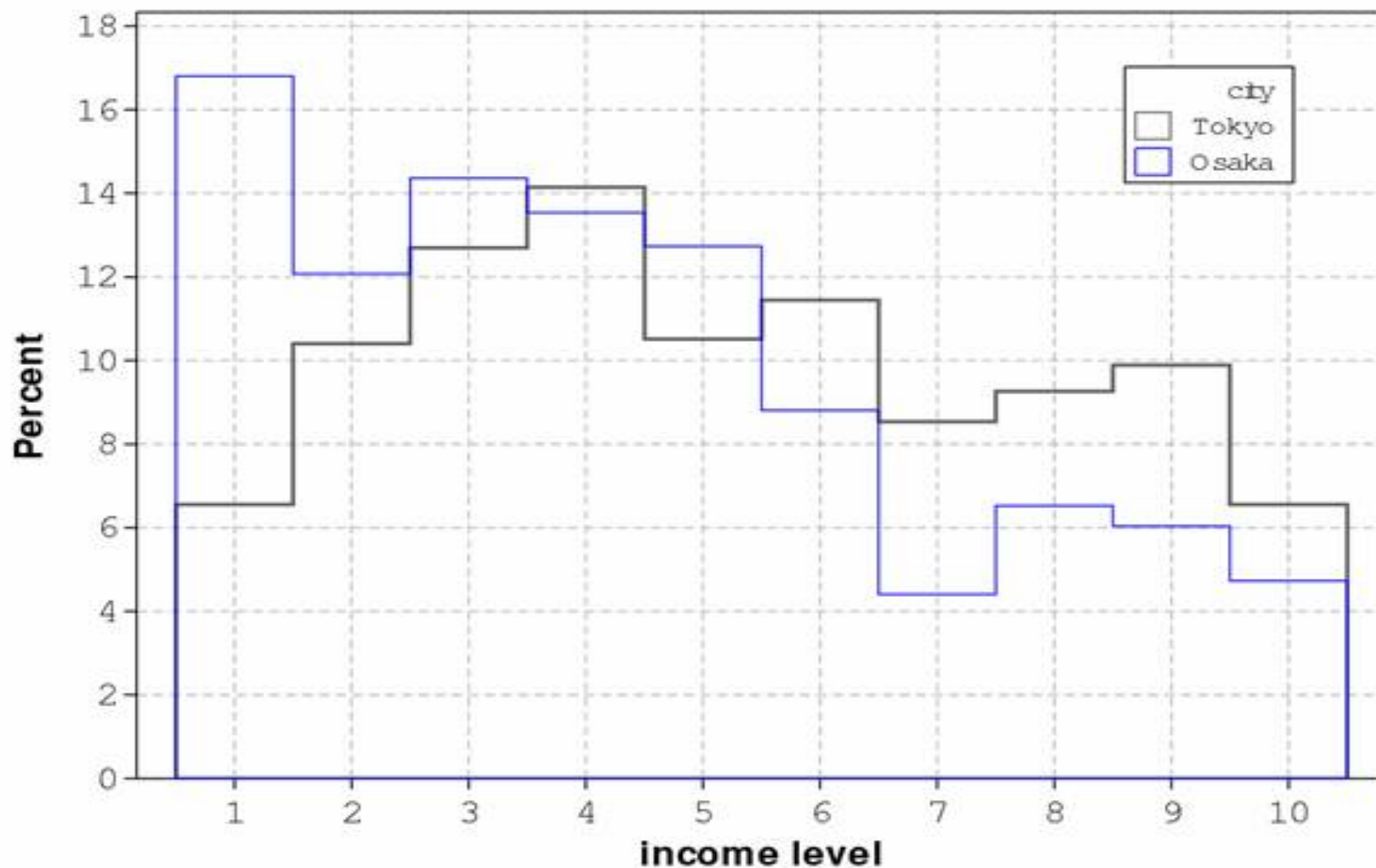
Japanese Consumers Value by Grade JPY/100gm

Grade	Fail	3*	4*	5*
Tokyo (990)	248	464	776	1338
Osaka (630)	243	468	781	1414
All	244	466	779	1368
Above previous grade		222	313	589
Above fail		222	535	1125
% of fail value		191%	320%	562%

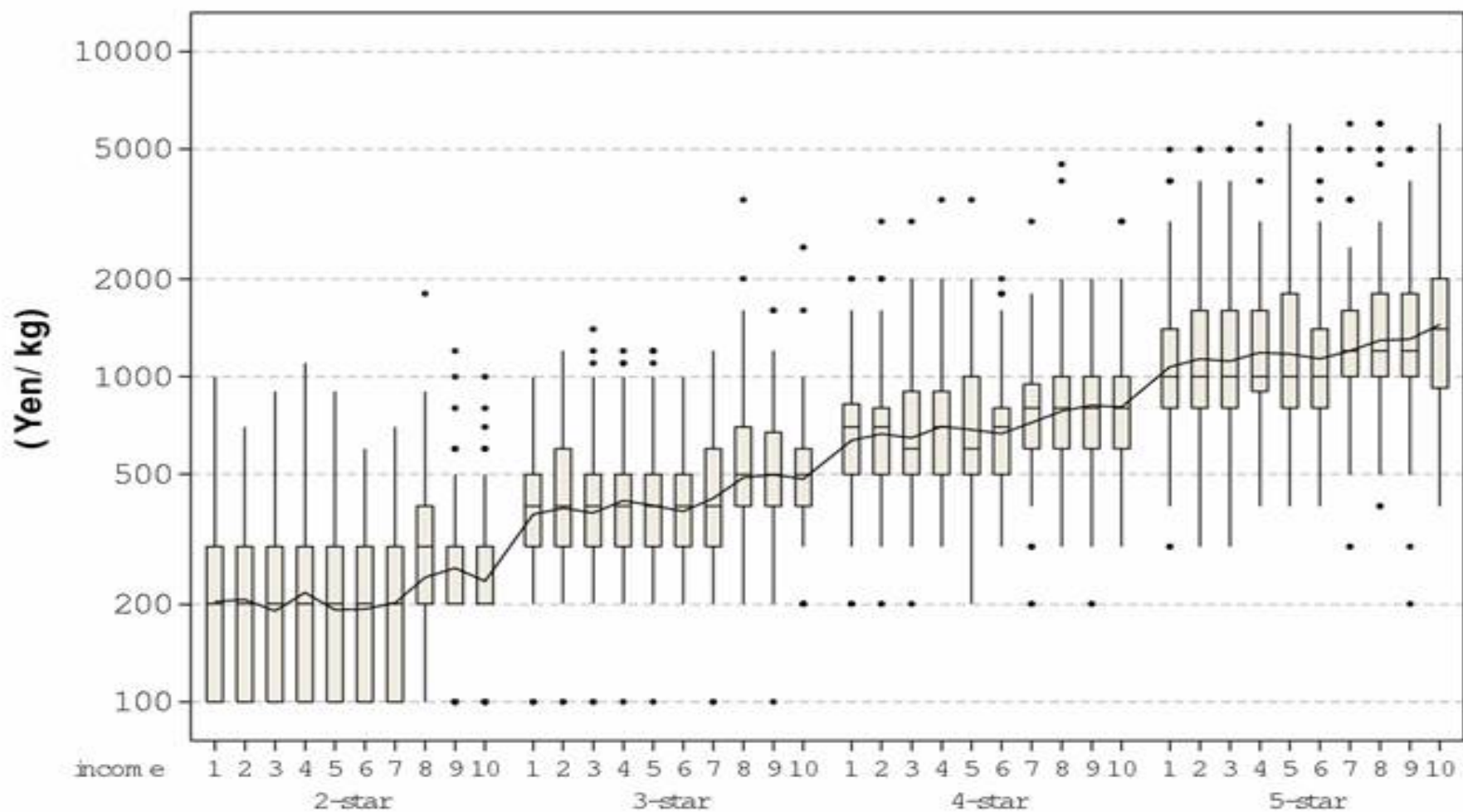
Japanese Consumer Values by Grade & City - ¥/100gm



Japanese Consumers – Income Level by City



Japanese Consumer Value by Grade & Income - ¥/100gm



Japanese Consumers - ¥/100gm by Grade & City

