

# SUITABILITY OF BREEDS AND CROSSBREDS FOR THE JAPANESE BEEF MARKET

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## SUMMARY

Liberalisation of entry to the Japanese beef market provides opportunities for Australian beef and dairy producers to receive higher prices for their cattle provided they meet the specifications of the various market segments. Steers of a wide range of maturity types comprising Hereford, Jersey, Charolais and Simmental cross genotypes were lot fed for approximately 300 days on a high energy ration. Jersey Hereford crosses yielded similar quantities of red meat but with higher marbling than Herefords. Charolais Jersey Hereford, Charolais Simmental and 3/4 Simmental yielded an additional 40-50kg of red meat with similar marbling to the Herefords. All groups had white fat and ideal meat colour for the Japanese Trade.

## INTRODUCTION

Liberalisation of entry to the Japanese beef market provides opportunities for Australian beef and dairy producers to receive higher prices for their cattle provided they meet the specifications of the various market segments. The Japanese beef market can be divided into various segments with quite different characteristics. Beef from local Wagyu cattle which commands the highest prices is characterised by high levels of intramuscular fat and less subcutaneous fat than cattle of British breed origin at the same weight. Beef from dairy types (mainly Holstein) commands second highest prices, followed by imported (mainly Angus, Hereford and Murrey Grey) with the lowest prices being paid for cow and bull beef. It would appear that as the degree of marbling increases the price paid per kilogram increases. The price is also affected by estimates of red meat yield, fat and meat colour. A project was developed by the AMLRDC to identify genotypes which, when grain fed, will produce carcasses suitable for the high priced Japanese market. The main challenge was to find genotypes with high marbling scores, low subcutaneous fat and with white fat. The main project concentrated on sires within the Hereford, Poll Hereford Angus and Murray Grey breeds which have already gained acceptance in the market. However, U.S. studies (Cundiff et al. 1988) indicate that the variation across breeds and crossbreds offers considerable scope for utilising genotypes with particular desirable features, e.g. propensity to marble. The project reported here looked at a range of crossbred genotypes based on the Hereford.

## METHODOLOGY

101 steer calves (9 months of age) representing a range of genotypes from very early maturity to very late maturity were assembled at Struan Research Centre. The following 6 breed types were represented:-

50% Jersey 50% Hereford (JH)  
Hereford x Hereford (HH)  
50% Charolais 25% Simmental 25%  
Hereford (CSH)

75% Hereford 25% Jersey (HJH)  
75% Simmental 25% Hereford (SSH)  
50% Charolais 25% Jersey 25% Hereford  
(CJH)

A minimum of 11 steers were represented in the groups which comprised steers from various trials on the Research Centre and support property in 1989. The steers were grazed on an irrigation property at Shepparton in Victoria until June 1989. This period was very wet and very low growth rates were achieved. They were transferred to the I.C.M. feedlot at Peechelba in June where high energy rations were fed for between 300-350 days until slaughter.

Carcass measurements and quality evaluations were taken at slaughter. Quality evaluations included eye muscle area, fat cover, marbling, fat and meat colour. The largest steers in each breed group were held over and slaughtered after 350 days on feed.

**Table 1 Weight(kg) and carcass details of steers**

	J H	H J H	H H	C J H	C S H	S S H
<b>All Steers</b>						
Wt. on entry 8/6/89	302	322	328	372	380	378
Wt. 10/4/90 (kg)	623	665	654	762	758	723
Wt. gain/day 8/6/89-10/4/90	1.06	1.12	1.05	1.27	1.23	1.13
<b>Steers slaughtered 11/4/90 after 300 days in feedlot (quartered 10/11 rib)</b>						
Number slaughtered	8	21	12	15	10	8
Wt. 10/4/90 (kg)	595	637	624	735	745	692
Carcass wt. (kg)	337	363	366	428	442	405
Hot Fat thickness						
rump (P8)	17.1	24.5	24.7	18.3	13.2	15.8
Dress %	56.6	57.0	58.6	58.2	59.4	58.5
Eye muscle area cm <sup>2</sup>	70.4	70.3	66.0	88.6	96.0	82.8
Marbling (1-12)	2.88	2.76	2.33	1.80	1.90	2.00
Meat colour (1-9)	2.75	2.67	2.75	2.93	3.20	3.25
Fat colour (1-10)	1.00	1.14	1.00	1.13	1.00	1.00
Est. Total lean meat (kg)	179	185	181	227	241	213
<b>Steers slaughtered 1/6/90 after 350 days on feed (quartered at 5/6 rib)</b>						
Number slaughtered	5	6	4	5	3	3
Wt. 31/5/90 (kg)	687	764	754	855	824	828
Carcass wt. (kg)	382	439	433	486	483	485
Hot Fat thickness						
Rump (P8)	27.5	37.3	39.0	13.6	23.7	26.3
Dress %	55.6	57.4	57.5	56.8	58.6	58.6
Marbling Score	4.60	4.17	2.50	3.00	3.00	2.33
Meat colour	4.00	3.67	4.00	4.00	3.67	4.33
Fat colour	1.60	1.20	1.00	1.20	1.00	1.33
Est. Total Lean Meat (kg)	190	195	183	247	250	243

## RESULTS AND DISCUSSION

### Entry weight

The Jersey Herefords were significantly lighter than all others. There was no significant difference between Hereford and Hereford Jersey Hereford but the Charolais and Simmental crosses were significantly heavier at the start of feeding.

### Growth

Growth rates were low (less than 1kg/day) during agistment at Shepparton. However, at the feedlot, growth rates peaked (>1.5kg/day) during September and gradually reduced (<1kg/day) as steers matured in February to April. These growth rates are higher than normally recorded in Japanese feedlots where growth rates of 0.6-1kg/day occur.

### Final weights

Relative to the Hereford (H = 100%) at the start and finish there was no change in rankings of the different genotypes over the 12 months on feed, i.e. weights at start and finish were Jersey Hereford (90,91), Hereford Jersey Hereford (99,101), Charolais Jersey Hereford (110,113), Charolais Simmental Hereford (112,109) and Simmental Hereford (111,110). This result is surprising in that it could be expected that the early maturing types would have reduced gains at heavy weights when compared with the later maturing types.

### Carcass weight

All carcasses weighed in excess of the minimum 270kg required for Japanese lot fed beef. However, some carcasses exceeded the 450kg upper limit. Charolais sired carcasses averaged more than 50kg heavier than the Hereford carcasses whereas Jersey sired carcasses weighed 30kg less than Hereford sired carcasses in the lighter weight group and 49kg less in the heavy group.

### Fat thickness

There was no significant difference between the Hereford and Hereford Jersey Hereford but these both had significantly more rump fat than all other groups. As much of the subcutaneous fat has to be trimmed this fat represents wasted energy and labour costs and is not compensated for with higher prices.

### Dressing percentage

The highest dressing percentage was recorded for the Charolais Simmental Hereford group (59.4) and the Jersey Hereford (56.6) and Hereford Jersey Hereford (57.0) were significantly lower. Dressing percentage is seen as a major factor affecting returns to meatworks and is therefore one of the reasons lower prices are paid for dairy crossbred livestock in Australia.

### Eye muscle area

All carcasses met the minimum eye muscle area specifications. There was no significant difference between the Hereford, Hereford Jersey Hereford and Hereford Jersey which had less muscle area than the Charolais Jersey Hereford and Simmental Hereford. The Charolais Simmental Hereford had significantly greater muscle area than all others.

### Marbling score

In the heavier carcasses the Jersey Hereford had significantly more marbling than all others. In the lighter carcasses the differences showed the same trends but were not statistically different. However, all 13 carcasses which had marbling score 4 or greater had a Jersey component in their genotype, 2 of these had score 6 and two score 7.

### Meat colour

Hereford Jersey Hereford carcasses had the lightest coloured meat and Simmental Hereford the darkest. However all carcasses were in the acceptable range for the Japanese market.

### Fat colour

All carcasses had white fat which can be expected when high grain rations are fed for extended periods.

### Estimated total lean meat yield

In both slaughter groups Jersey Hereford, Hereford Jersey Hereford and Hereford yielded similar total weight of red meat but the carcasses with European breed component yielded an additional 40-50kg of meat. Despite a difference of 67kg in carcass weights between the two Hereford slaughter groups there was only a 2kg difference in estimated total lean meat yield. Other differences were Jersey Hereford (45:11), Hereford Jersey Hereford (76:10), Charolais Jersey Hereford (58:20), Charolais Simmental Hereford 41:9) and Simmental Hereford (80:30). This is consistent with the concept that as animals approach maturity additional increments in muscle are relatively small compared with increments in fat deposition.

## **CONCLUSIONS**

I believe that these results are consistent with the U.S. results which indicate that Jersey crosses can increase marbling, decrease subcutaneous fat with a slight penalty in dressing percentage. If however, the surface and inter-muscular fat are removed little difference in yields of meat could be expected.

The Charolais and Simmental influence significantly increased red meat produced with similar marbling to Herefords.

If the price incentive for highly marbled carcasses is a reasonable goal then more work on other early maturing crosses is indicated in conjunction with management and feeding strategies which match more closely the Japanese rearing systems. If the Japanese market for moderately (2-3 score) marbled meat develops further then it would appear that the European crosses offer considerable advantages in terms greater meat production and reduced fat trim compared with Herefords. Further work should be done to compare various high yield terminal sires for such markets.

## **REFERENCES**

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