

# Handling Stress During Marketing of Pigs from Large Groups

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## SUMMARY

When handled through the same facilities, pigs from large and small groups required similar levels of force during handling. However, pigs from large groups tended to load more quickly. Pigs from the two treatments had similar physiological responses to handling. When given adequate lairage time to recover from handling and transportation, meat quality was similar between group size treatments.

## INTRODUCTION

We have previously shown that pigs from large groups are more socially tolerant than pigs from conventional small groups and will fight less when re-grouped, as happens during marketing. Anecdotal evidence from producers and truckers indicates that pigs from large groups are easier to handle and load. These two factors could combine to result in less marketing stress for pigs from large groups, with a potential to improve meat quality. Indeed, farms using large group auto-sort housing have been reported to have fewer death losses during marketing than conventional farms (Brumsted et al., 2004).

This study was conducted to compare handling attributes, stress responses, and meat quality of pigs from conventional and large group auto sort pens marketed through the same facilities.



## RESULTS AND DISCUSSION

Two hundred forty pigs raised in either conventional small groups (16–18 pigs/pen) or in large groups with auto-sort facilities (approx. 250 pigs/pen) were marketed on 10 days to assess differences in response to handling and meat quality. Pigs were loaded in groups of 4 pigs up a ramp onto a trailer. Transportation to the packing plant was 45 min in length and lairage was approximately 4 hours. Behavioral and physiological measures were taken prior to, during and after the handling and transport process. Standard meat quality assessment was conducted on loins from the animals 24 h after slaughter.

*“Pigs from small groups tended to take approximately 25 seconds longer to load up the ramp than did pigs from large groups.”*

Although the time taken to load a group of 4 pigs varied considerably, it took approximately 50% longer to run pigs from small groups up the loading ramp (Table 2,  $P < 0.10$ ). The need for electric prods, as defined in this study, was similar for both treatments. However, the number of shocks applied to a group, although similar statistically, reflected the amount of time needed to load pigs from each treatment.

The only differences observed in heat balance variables (temperatures, skin colour and breathing) were early in the handling of the pigs, with an increase in rectal temperature after removal from the pen, and an increase in ear temperature once on the transport trailer for the pigs from small groups (Table 1,  $P < .05$ ). Cortisol levels, reflective of acute stress, increased approximately 3-fold from in the barn prior to loading, to after unloading at the plant. However, these values did not differ between large and small group treatments.

**Table 1.** Physiological data of pigs from large and small groups during various stages of the marketing process.

BARN	Group Size			
	(prehandling)	Large	Small	SE P-Value
Ear Temp.		34.0	34.5	0.33 0.18
Rectal Temp.		39.2	39.5	0.09 0.02
Cortisol		11.4	10.4	0.70 0.32
Breathing Score		1.0	1.02	0.03 0.34
Skin Score		1.01	1.11	0.08 0.21
TRUCK	Group Size			
		Large	Small	SE P-Value
Ear Temp.		32.2	33.8	1.19 0.01
Rectal Temp.		40.0	40.1	0.26 0.68
Breathing Score		1.08	1.10	0.05 0.68
Skin Score		1.20	1.21	0.10 0.93
PLANT	Group Size			
		Large	Small	SE P-Value
Ear Temp.		32.7	33.5	0.66 0.10
Rectal Temp.		39.1	39.1	0.12 0.95
Cortisol		31.8	27.1	3.25 0.13
Breathing Score		1.07	1.04	0.03 0.35
Skin Score		1.38	1.33	0.08 0.64

**Table 2.** Assessment of handling of pigs from large and small groups during the loading process.

	Group Size		SE	P-Value
	Large	Small		
Level of Encouragement	2.83	2.90	0.08	0.47
Number of Shocks/group	8.30	12.03	3.37	0.21
Duration of Loading/group	52.58	78.71	10.84	0.09

**Table 3.** Meat quality assessment of pigs from large and small groups

	Group Size		SE	P-Value
	Large	Small		
pH	5.75	5.71	0.02	0.12
Texture	3.36	3.25	0.08	0.29
Colour	3.43	3.24	0.08	0.08
Marbling	2.51	2.71	0.13	0.04*
L*	51.8	53.4	0.91	0.02*
a*	2.60	2.95	0.23	0.05*
b*	10.25	10.18	0.72	0.92
Japanese Colour	3.45	3.36	0.12	0.21
Drip Loss	9.74	9.88	0.45	0.77

Meat quality measures evidenced significant differences between treatments for marbling, and three of the Minolta light variables. Pigs from small groups had a higher degree of marbling and higher light reflectance (L\*), but also a redder colour (a\*), (Table 3,  $P < 0.05$ ). The trends, although not statistically significant, among other meat quality scores would suggest slightly less response to stress in large group pigs (see pH, color, and Japanese color).

This study represents a comparison of responses to handling of pigs from large and small groups on the same farm, and through the same loadout and transportation vehicle. As such, confounding that may occur when analysing treatments when farms represent different treatments was avoided. Under these conditions we found only minor differences in handling, although pigs from large groups did tend to load more quickly.

Meat quality effects due to handling stress may have been masked by the 3-4 hour lairage time used in this study. This length of holding is preferred within the industry because it does attenuate problems during marketing, particularly if short transportation times are involved.

## CONCLUSIONS

Pigs from small groups evidenced elevated rectal and ear surface temperatures early in the handling process, but no differences were found after arrival at the packing plant. Difficult groups of pigs were encountered when loading in both treatments, and similar levels of force, generally involving the use of the electric prod, were used. Pigs from small groups tended to take longer to load up the ramp than did pigs from large groups (78.7 vs 52.6 sec/group;  $P < 0.10$ ). Meat quality differences were minor, with pigs from small groups having more marbling. No differences in meat quality scores reflective of differential responses to handling were evident.

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