

Effects of Handling Intensity on Surface Temperature when Loading Market Weight Pigs

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Summary and Implications

The objective of this study was to determine the relationship between handling intensity and surface temperature of the market weight pig at the time of loading on commercial farms. One hundred and fifty-five loads of market weight pigs were used. Handling intensity (HI) score ranged from 1 to 5 where 1 was very good handling and 5 was very poor handling. Researchers took pig movement, use of handling tools, and vocalizations, slips and falls, and stress signs into consideration when scoring. All data is presented descriptively. A total of 77.4 % scored ≤ 3 for HI, indicating a positive animal-human interaction at the time of loading. A total of 20.0 % scored a HI of 4 and 2.6 % of loads being scored a HI of 5 (4 loads/155 total loads scoring unacceptable). When moving from HI 1 (very good handling) to HI 5 (very poor handling) the surface temperature increased 2.7 °C. However, the relationship was very weak ($R^2 < 0.01$). In conclusion, over 76 % of observed loading events were classified as normal handling or better, indicating a positive animal-human interaction. However, the relationship between HI score used in this study and the recorded surface temperature of pigs was very weak. Therefore, collecting pig surface temperature does not seem to be a useful assessment tool when using this specific HI scoring system.

Introduction

Good animal handlers who understand pig behavior, the production system, and the impact on pork quality can minimize poor facility design. In most commercial settings in the Midwestern U.S., pigs are placed in wean-to-finish buildings with little to no direct contact with humans; generally, the pigs do not leave their home pen until they are marketed. Stressors at loading could be related to the physical exertion, noise, unfamiliar experience, and close contact with humans. In addition, how the pig and handler interact during the marketing process is critical for the well-being of the pig and the safety of the handler. Different handling tools are used on farm including electric prods

(“goads” / “hot-shots”), sort-and flying V boards, rattles, and paddles. Handling intensity is a relative scale, used to compare animal-human interactions. Pigs that are handled “aggressively” or “intensely” have been reported to have higher rectal temperature and heart rate. In turn these pigs more likely to become non-ambulatory, and display more stress signs (open mouth breathing and skin discoloration). However, the relationship between market weight pig surface temperature and handling intensity at loading has not been investigated. Therefore, the objective of this study was to determine the relationship between handling intensity and surface temperature of the market weight pig at the time of loading on commercial farms.

Materials and Methods

This project was approved by the Iowa State University Institute for Animal Care and Use Committee. Six trained researchers collected data during loading. The researcher stood in a location where they could see the pigs, but were not interfering with the loading process. This location was either just inside the barn or in the handler area of the loading chute.

Animals and housing. Market weight commercial barrows and gilts pigs from barns were transported to a commercial packing plant, all facilities were located in Iowa. Pigs weighed 122 ± 6 kg. This experiment used 155 trailers carrying > 22,000 pigs. Data was collected during two-1 wk periods during June and July 2011.

Handling intensity (HI). During loading, 100 pigs/load had the number of vocalizations, slips and falls, stress signs, and willful acts of abuse counted. After loading was complete, a HI score was assigned using a 1 through 5 scale, where 1 was very good handling and 5 was very poor handling (Table 1).

Surface temperature measurements. Surface temperatures were collected at loading using a dual laser infrared thermometer (model 42750: Dual Laser Infrared Thermometer Extech Instruments) with a sensitivity of 0.1 °C. Temperatures were taken laterally near the midline of 10 pigs/load.

Statistics. The experimental unit for HI and surface temperature was a trailer of pigs. For each load the surface temperatures from 10 pigs were averaged. Data will be presented descriptively. Excel was used to find the relationship (R^2) between surface temperature and handling intensity.

Results and Discussion

A total of 77.5 % loads scored ≤ 3 for HI, indicating a positive animal-human interaction at the time of loading. A total of 20.0 % scored a HI of 4 and 2.6 % of loads scored a HI of 5 (4 loads/155 total loads scoring unacceptable; Figure 1).

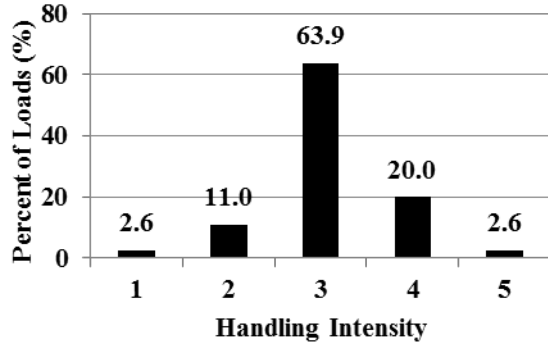


Figure 1. Handling intensity score for 1551 loads of market weight pigs on commercial farms in Iowa in June and July 2011

The mean, SD, minimum, and maximum values of surface temperature ($^{\circ}\text{C}$) are presented descriptively in Table 2. When moving from HI 1 (very good handling) to HI 5 (very poor handling) the surface temperature increased 2.7 $^{\circ}\text{C}$. However, the relationship was weak ($R^2 < 0.01$).

Table 2. Surface temperatures for 155 of the market weight pigs on commercial farms over June to July 2011

Handling intensity	n, loads	Temperature, $^{\circ}\text{C}$			
		Mean	SD	Min	Max
1	4	31.4	1.1	29.9	32.1
2	14	33.2	2.4	29.0	37.6
3	87	32.5	2.9	25.1	39.0
4	30	32.5	4.0	25.2	40.1
5	4	34.1	1.1	33.1	35.4

Over 77 % of observed loading events were classified as normal- or better handling, indicating a positive animal-human interaction. However, the relationship between HI score used in this study and the recorded surface temperature of pigs was very weak. Therefore, collecting pig surface temperature does not seem to be a useful assessment tool when using this specific HI scoring system.

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Table 1. Definitions of handling intensity scores.

Handling intensity	Measure	Description
1 Very good handling	Loading	> 90 % pigs walk onto the trailer voluntarily.
	Pig-human interaction	Handling tools ¹ make no contact with pigs. Pigs are not rushed ² onto the trailer.
	Sound	Loading is quiet with very few slips, falls, and pig vocalizations.
2 Good handling	Loading	≥ 51 to 90 % of pigs walk onto the trailer voluntarily.
	Pig-human interaction	Handling tools make contact with several pigs. Very few pigs are rushed onto the trailer.
	Sound	Loading is relatively quiet with a few slips, falls, and pig vocalizations.
3 Normal handling	Loading	~ 50% of pigs walk on the trailer voluntarily
	Pig-human interaction	Handling tools make contact with many pigs. Pigs are rushed onto the trailer.
	Sound	The loading is quite loud and rough with many slips, falls and vocalizations.
4 Poor handling	Loading	10 to 49 % pigs walk onto the trailer voluntarily.
	Pig-human interaction	Handling tools contact a lot of pigs. Pigs are rushed onto the trailer and pigs that would have loaded without handler action are contacted with handling tools. Pigs are handled unacceptably ³ by at least one handler.
	Sound	The loading is loud and rough resulting in a lot of slips, falls and vocalizations.
5 Very poor handling	Loading	≤ 9 % pigs walk onto the trailer voluntarily.
	Pig-human interaction	Pigs are rushed onto the trailer and pigs that would have loaded without handler action are contacted with handling tools. Handling tools contact a lot of pigs multiple times. Pigs are unacceptably handled multiple times by at least one handler.
	Sound	The loading is loud and rough resulting in a lot of slips, falls, and vocalizations.

¹ Handling tools rattles, paddles, rattle-paddles, flags, rattle-bats, sorting boards and other items used to handle pigs

² Rushed was defined as pigs being pushed to walk at a faster than normal pace

³ Unacceptable handling, as defined by Transport Quality Assurance or American Meats Institute using handling tools on sensitive areas of the pigs or touching the pig multiple times with a handling tool resulting in a squeal