

EFFECTS OF EXTREME TEMPERATURE CONDITIONS ON MORTALITY RATES IN SLAUGHTER PIGS DURING TRANSPORT

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During transportation of pigs a number of factors can increase the mortality rate such as genotype, distance, road quality, type of lorry, and most importantly the weather conditions (Grandin, 1997). Both extremely high and low temperatures (combined with increased air velocity) could easily double the mortality rates resulting in considerable economic losses. In order to reduce high mortality rates, preventive measures have to be taken.

Thus, the aim of this study was to establish effects of the selected meteorological factors on transport loss in pigs. Daily transport data of three large-scale pig producers (Farm A, B and C) has been analyzed for a two years period (N=87082). Shipping distance (120 km) from farm to abattoir was the same for each farm. Pigs on Farm A belonged to a stress susceptible hybrid whereas pigs on Farm B and C were stress resistant strains. Mortality rate (MT) for each lorry was recorded. The study was conducted at the Gyula Packing Plant (Hungary). Daily meteorological data recordings included daily minimum, maximum and average temperature values (C°), relative humidity (%) and precipitation (mm). The data were recorded at the local station of the Hungarian Meteorological Service. Loading started early in the morning and transport duration lasted for three hours generally. Consequently, attention was focussed on the relationship of daily minimum temperature (T_{min}) and mortality rate (MR) using regression analysis. Database was processed by SPSS 10.0 Program Packages for Windows.

The results of the regression analyses are summarized in Table 1. The findings reveal close, quadratic relationship between T_{min} and MR in stress-susceptible pigs (Farm A). Lower association was established for both stress resistant populations of farm 'B' and 'C'. The minimum value of the curve lies between 0 and 10 C°, approximately. Thus, MR was the lowest in this temperature interval during transportation. Below 0 C° the mortality rate increases at a faster rate, than above 10 C° within the range of 2.5-4.5 %, and 25-3 %, respectively.

Table 1. Relationship of daily minimum temperature (T_{min}) to mortality rate (MR) in pigs during transport
Dependent variable: mortality rate (%); Independent variable: daily minimum temperature (C°)

	A	B	C
<i>Results of the regression analyses</i>			
R	0.28	0.22	0.15
R ²	0.08	0.05	0.02
SE	1.12	0.53	2.32
F	7.98 ^{***}	1.63 ^{NS}	0.32 ^{NS}
$y=a+b_1x+b_2x^2$			
a	2.503 ^{***}	0.724 ^{***}	2.685 ^{***}
b ₁	-0.065 ^{***}	-0.008 ^{NS}	0.040 ^{NS}
b ₂	0.005 ^{***}	0.002 ^{NS}	-0.005 ^{NS}

^{***} P<0.001, NS=P>0.05

In conclusion, in stress susceptible pigs, significant effect of T_{min} on mortality rate during short distance transport was established in this study, which does not appear to be the case in stress resistant pigs.

GRANDIN, T. (1997). *J. Anim. Sci.* 75, 249-57.

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