

Timing Euthanasia to Maximize Welfare yet Minimize the Economic Impact

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The People's Perspectives

We visited 47 farms in NC and administered 388 surveys with a 100% response.

- ❑ 57% did not grow up on a farm
 - ❑ 59% had worked less than 5 years and
 - ❑ 86% had worked less than 10 years
 - ❑ 70% male and 30% female
 - ❑ 49% White and 35% Hispanic
 - ❑ 45% had 12 years of education
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The People's Perspectives

- ❑ 36% said euthanasia was not stressful
 - ❑ 46% wished they did not have to euthanize
 - ❑ 86% agree that it is more humane to euthanize than let it die. 14% disagree!
 - ❑ Spanish speakers were more negative (42%) than English (26%)
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The People's Perspectives

- ❑ 46% would do all euthanasia if compensated
 - ❑ 39% with 1 yr experience were more willing compared to only 8% with 4+ yrs experience
 - ❑ Education does not influence willingness
 - ❑ 80% would use a technique that took longer if it was less painful
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The People's Perspectives

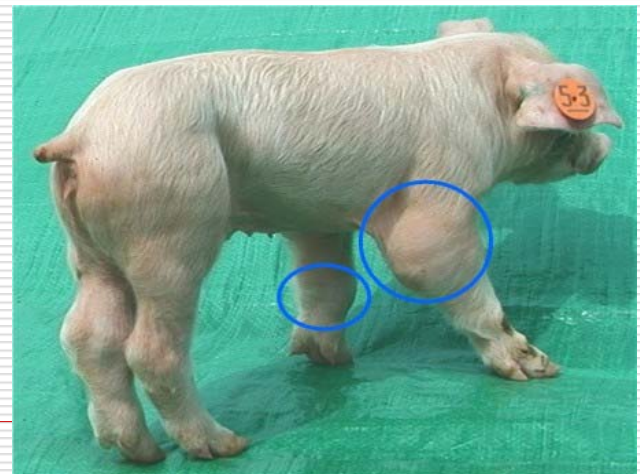
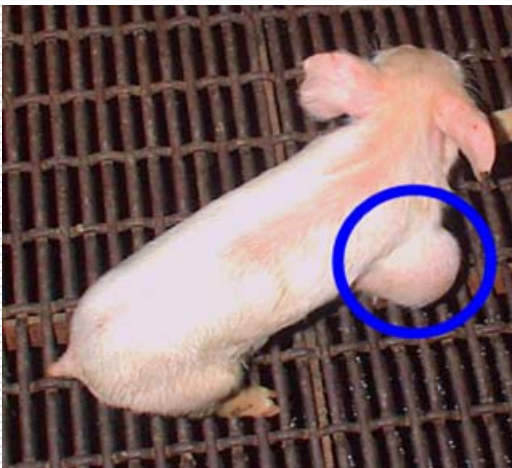
- 46% do not like to hold the pig
 - 18% used blunt trauma on 31+lb pigs
 - 79% said more training would be helpful
 - 76% prefer on-farm training
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What did we learn?

- ❑ Management needs to identify the 46% willing to do all the euthanasia.
 - ❑ Employees want more training and better guidelines.
 - ❑ Employees want to know how the pig “feels”.
 - ❑ Management must explain their protocol.
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Project Objective

To provide the economic and welfare information to help producers decide whether they should euthanize a casualty nursery pig or keep it.



Acknowledgements

- ❑ National Pork Board for funding the project
 - ❑ Ms. Stephanie Miller for her technical assistance
 - ❑ All the farm managers for their generous cooperation.
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Farms

- ❑ The study was conducted in 2002-2003 in 5 commercial nursery sites.
 - ❑ Each nursery was part of a 3-site production system and regularly received nursery-aged pigs from their supplier.
 - ❑ After growing for about 6 weeks the pigs were shipped to their respective finishing sites.
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Farms

- Farm A/1: Tagged pigs were left in the pens they were found in. The pig flow was a known PRRS positive flow with clinical problems. Two batches were processed and mean batch size was 3585 pigs. 200 pigs were euthanized and 80 tagged.
- Farm B/2: Tagged pigs were grouped into set pens if small or lightweight, but were left in the pens they were found if large or normal weight. The pig flow was known to be PRRS positive but not a clinical problem at this time. 12 batches were processed and mean batch size was 587 pigs.
- Farm B/3: Tagged pigs were grouped into set pens if small or lightweight, but were left in their original pens if of normal weight or heavier. This practice was used to prevent heavier lame pigs from physically abusing small weak tagged pigs. The pig flow was known to be PRRS positive but not a clinical problem at this time. Twelve batches were processed and mean batch size was 801 pigs.

Farms

- ❑ Farm C/4: Tagged pigs were grouped into set pens. The pig flow was a healthy PRRS-free flow. Six batches were processed and mean batch size was 2207 pigs.
 - ❑ Farm D/5: Tagged pigs were grouped into set pens. The site was recently depopulated and the pig flow was a healthy PRRS-free flow. 15 batches were processed and mean batch size was 930 pigs.
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Methods

- ❑ Batches of pigs were assigned to aggressive, moderate or conservative euthanasia regimes.
 - ❑ Pigs within batches were screened upon entering the nursery and either euthanized, tagged or penned normally depending on their condition and the assigned treatment.
 - ❑ The heavy protocol triggered euthanasia for conditions that were less severe than the medium protocol, and the light protocol triggered euthanasia only for the most compromised pigs
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Methods-conditions monitored

- Abscess (including inguinal, scrotal, jowl)
 - Beaten-up pig, numerous superficial skin wounds
 - Damaged digit
 - Ear- or flank-bitten
 - Gastrointestinal
 - Lamé (e.g., swollen joints)
 - Recently broken leg
 - Rectal prolapse
 - Repaired Ruptures (scrotal and umbilical)
 - Respiratory
 - Ruptures (scrotal and umbilical)
 - Tail bitten
 - Weak pig
 - Weight compromised (including runts)
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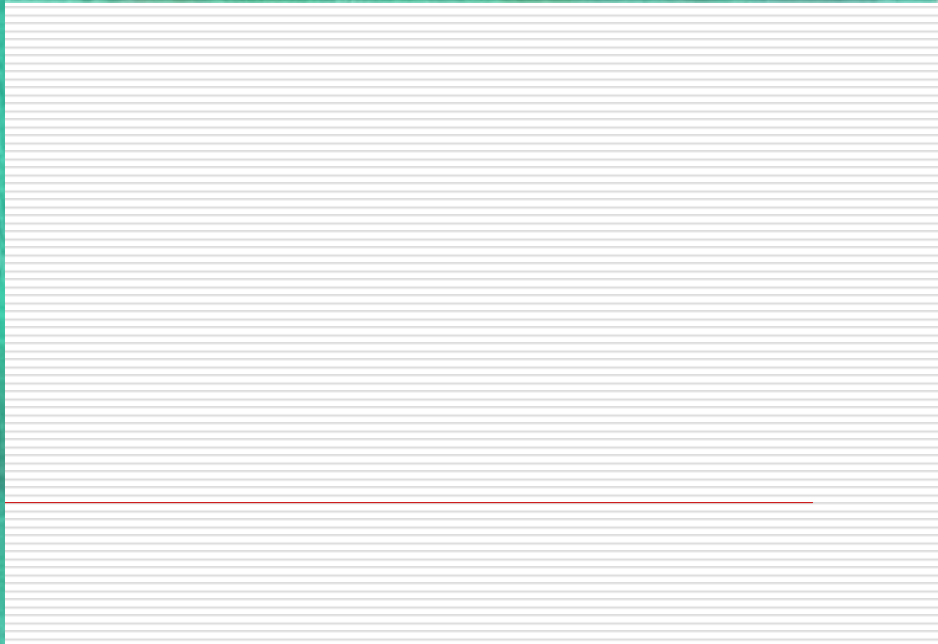
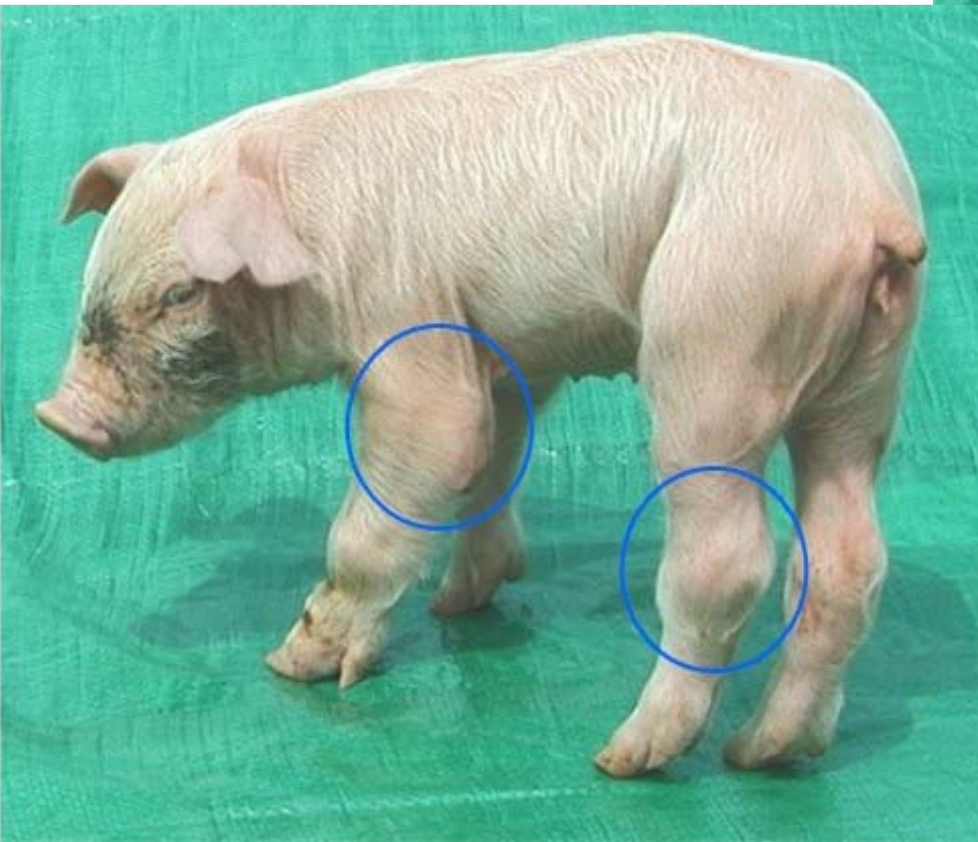
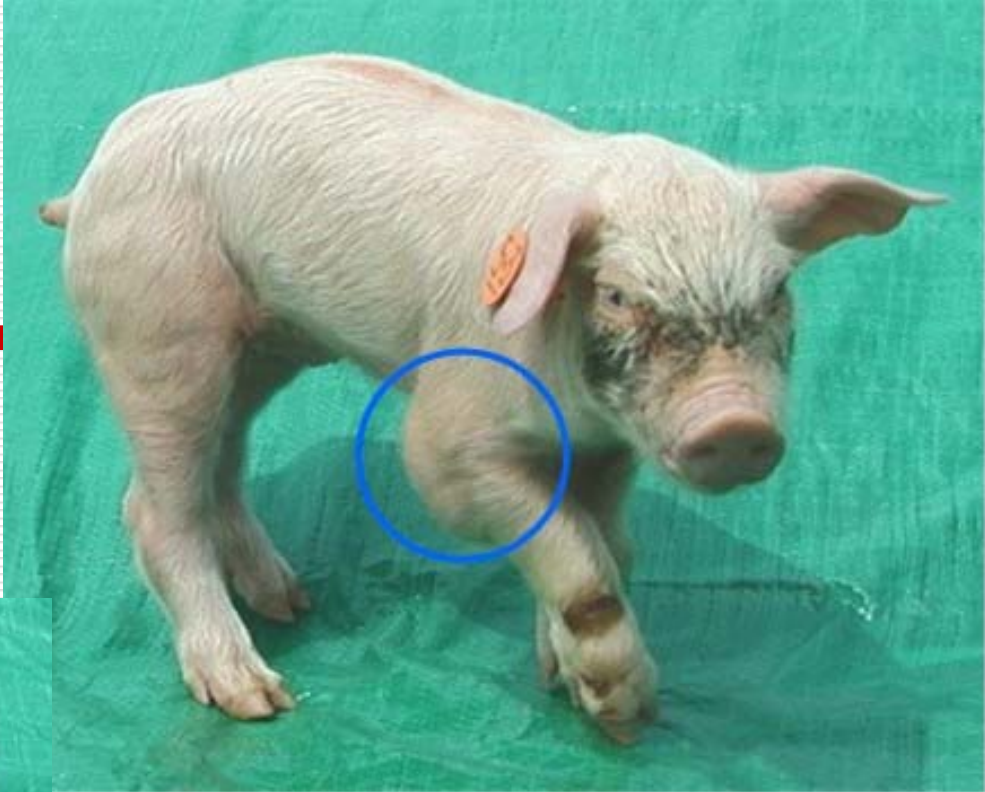
Assigning pigs

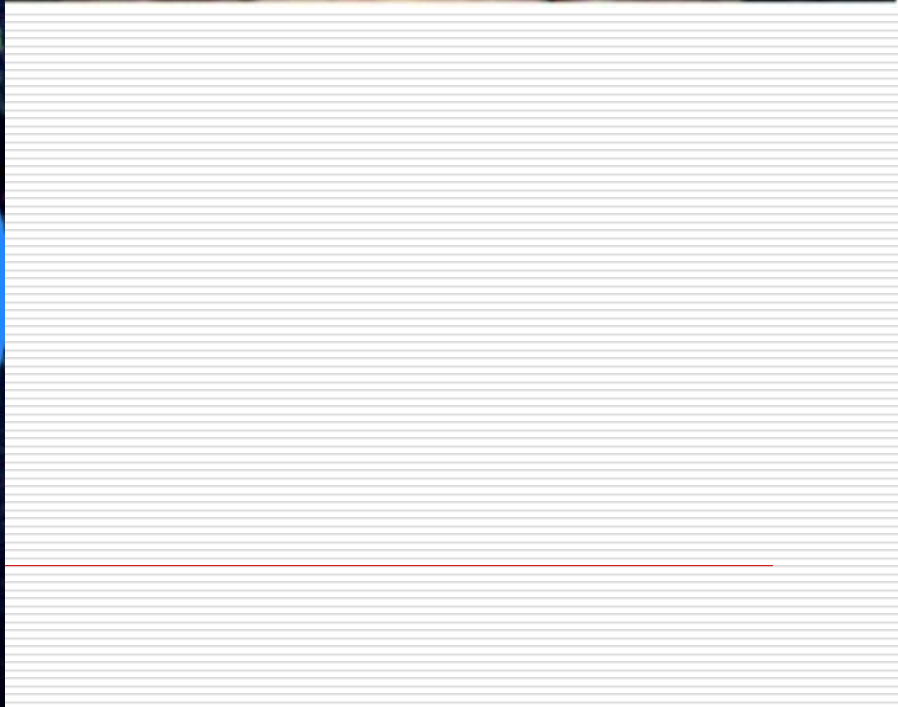
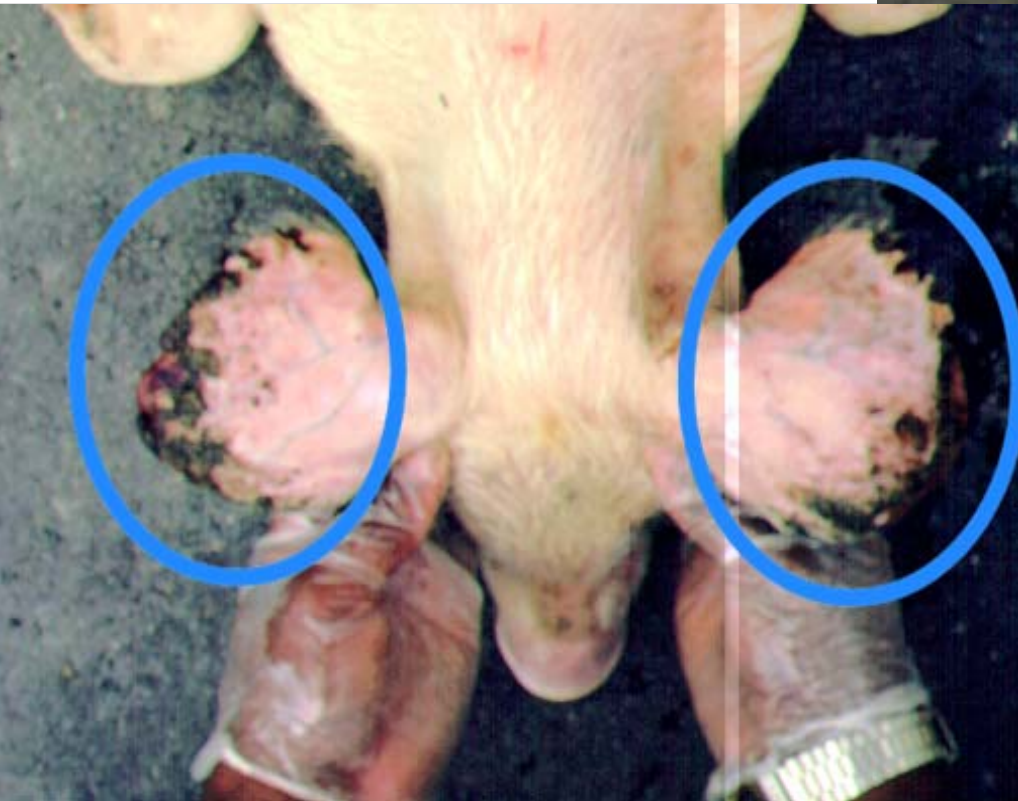
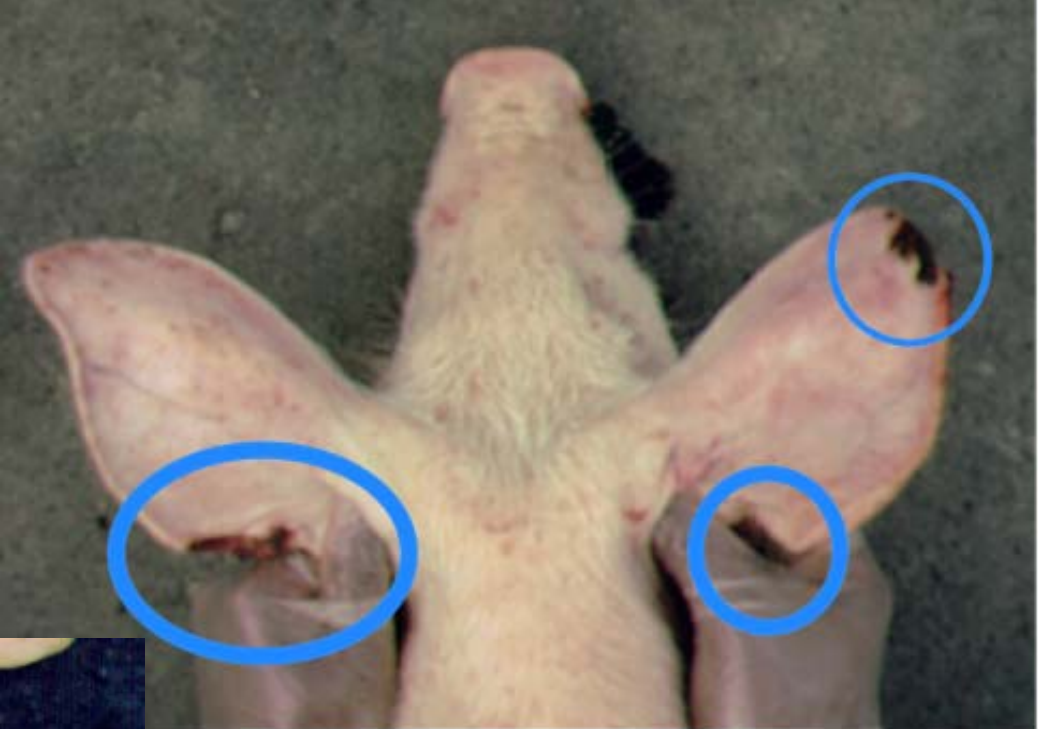
Lame: e.g., swollen joint(s)

Protocol

Conservative Moderate Aggressive

1 leg joint swollen and limping on 1 leg	No	No	Yes
2 or more joints swollen and limping on 1 leg	No	Yes	Yes
2 or more joints swollen and limping on 2 or more legs	Yes	Yes	Yes





Methods

- Any pig requiring veterinary treatment was treated according to standard operating procedures on the study farms.
 - The time taken to administer treatment was recorded as was the amount, type, and cost of drugs administered.
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Methods-economic value

- ❑ The value of the batch was the sum of the value of all casualty pigs in the batch.
 - ❑ The value of each casualty pig in each batch was established at shipping by partial budget (additional income + reduced expenses – reduced income – additional expenses).
 - ❑ Additional income was calculated as the product of the animal's weight at shipping by the standardized value of \$0.80 per lb.
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Methods-economic value

- ❑ If individual pig weights were not available the shipping weights were estimated from the shipping weights of contemporary pigs in the batch.
 - ❑ Cost of time was set at \$10/hour.
 - ❑ There were no reduced expenses or reduced income to consider.
 - ❑ If individual pig weights were not available the shipping weights were estimated from the shipping weights of contemporary pigs in the batch.
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Methods-welfare status

To quantify the status of welfare associated with each condition (e.g., lame, tail bitten, ruptures) and its level of severity.

- A (least severe)
- B
- C
- D (most severe)

We asked an expert panel to create a welfare score by ranking each level of each condition from 0 to 10

- 0: no effect on welfare
 - 1: little effect on welfare
 - 10: worst possible effect on welfare
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Methods-welfare status

Lame: e.g., swollen joint(s)

	Welfare Score
1 leg joint swollen and limping on 1 leg	3
2 or more joints swollen and limping on 1 leg	5
2 or more joints swollen and limping on 2 or more legs	8

Methods-welfare status

- Welfare score was the product of the assigned initial score for their condition and level and the number of days they experienced that condition. (until they recovered, died, were euthanized or left the nursery to go to the finishing stage)
 - A weak pig, level A, for 30 days would score 90 (3 x 30).
 - A low welfare score indicated fewer pigs were compromised for less time and a high score indicated more pigs were compromised for longer.
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Data analyses

- ❑ Analysis of co-variance (ANCOVA) in the GLM procedure of SAS
 - ❑ The dependent variables were value (\$) or welfare.
 - ❑ The model included farm, protocol, barn, reason and the level of reason as nominal (class) data. Barn was nested in farm and level nested in reason.
 - ❑ The batch, one turn of a nursery room, was the experimental unit.
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Results

- ❑ Screened: 51,041 nursery age pigs
#Batches: 47
 - ❑ Euthanized: 819 (1.6%) immediately
 - ❑ Tagged: 1118 (2.19%)
 - 186 (16.64%) died
 - 924 (82.65%) shipped to finishing
 - 8 (0.71%) lost to follow up
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Farm (Owner /Sites)	Number of batches	Number of hogs screened	Number of pigs Euthanized (%)	Number of pigs tagged (%)	Number of tagged pigs that died. (%)	Number of tagged pigs shipped. (%)
A/1	2	7171	200 (2.79)	80 (1.11)	25 (31.25)	49 (61.25)
B/2	12	7052	17 (0.24)	125 (1.77)	31 (24.8)	92 (73.60)
B/3	12	9618	12 (0.12)	343 (0.12)	18 (5.25)	325 (94.75)
C/4	6	13239	432 (3.26)	390 (2.94)	18 (4.61)	372 (95.38)
D/5	15	13961	158 (1.13)	180 (1.29)	94 (52.22)	86 (47.78)
Total	47	51041	819 (1.60)	1118 (2.19)	186 (16.64)	924 (82.65)

Final disposition of lightweight pigs <all treatments>

Level	Number Euthanized	Number tagged	Number died (as % of tagged)	Number shipped
A	5	14		14
B	131	325	31 (9.54)	294
C	317	141	25 (17.73)	116
D	167	0		

Final disposition of lame pigs <all treatments>

Level	Number euthanized	Number tagged	Number died (as % of tagged)	Number shipped
A	37	66	18 (27.27)	48
B	16	28	15 (53.57)	13
C	14	1		1

Figure 1A. Economic Value and Welfare Costs by Condition (reason) for Light Protocol Least-Squared Means

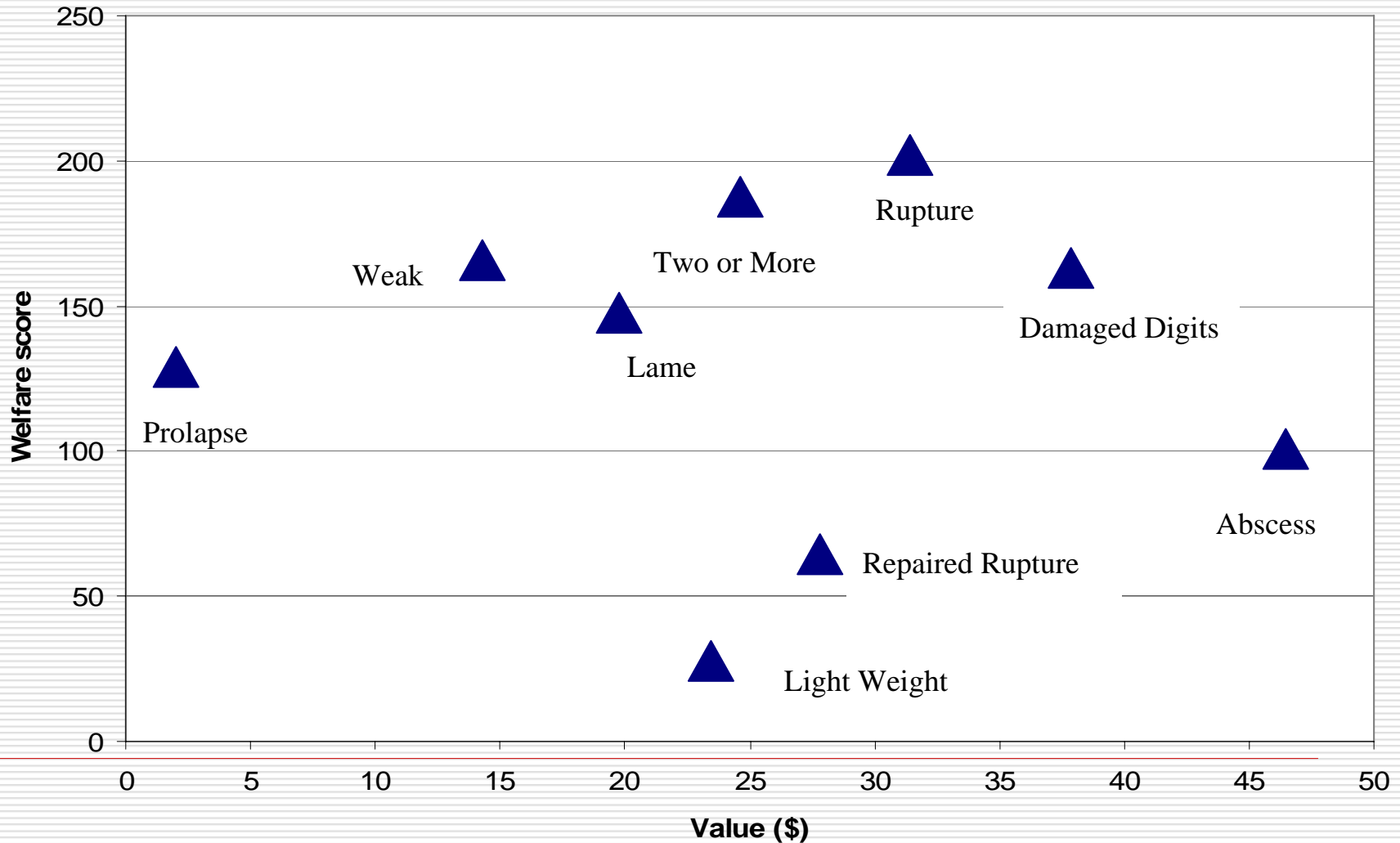


Figure 1B. Economic Value and Welfare Cost by Condition (reason) for the Medium Protocol Least-Squared Means

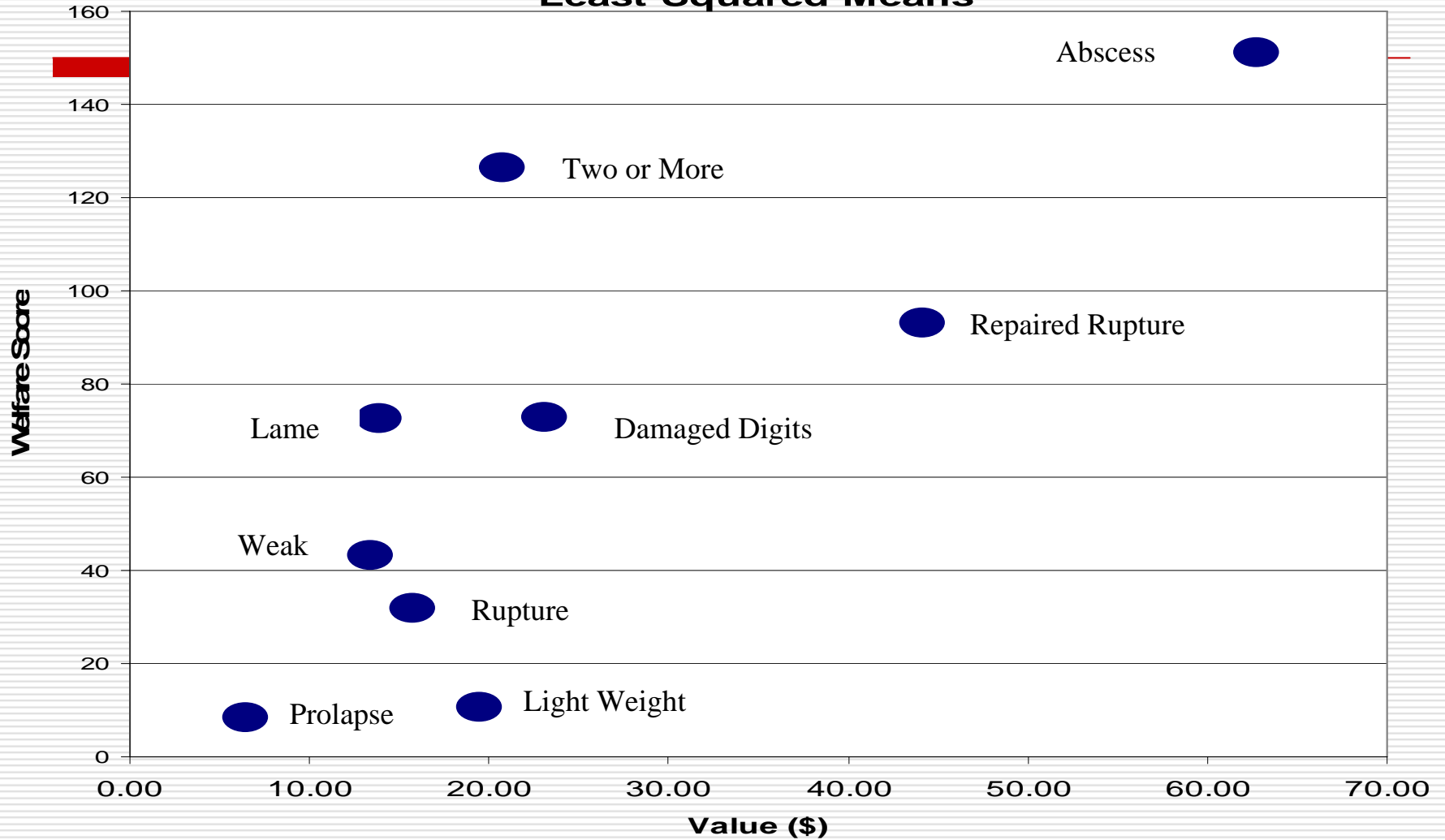


Figure 1C. Economic Value and Welfare Costs by Condition (reason) for Heavy Protocol Means

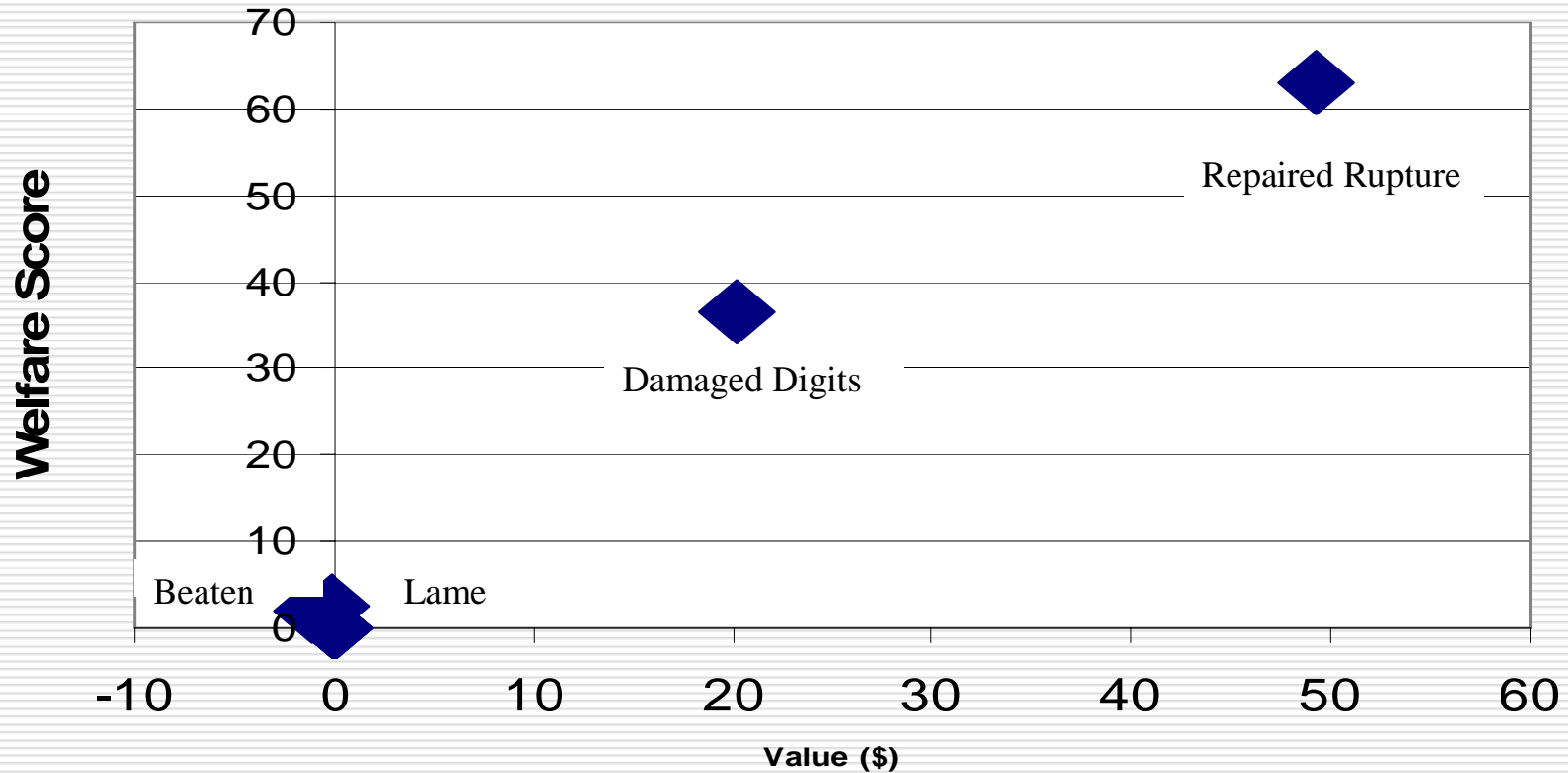
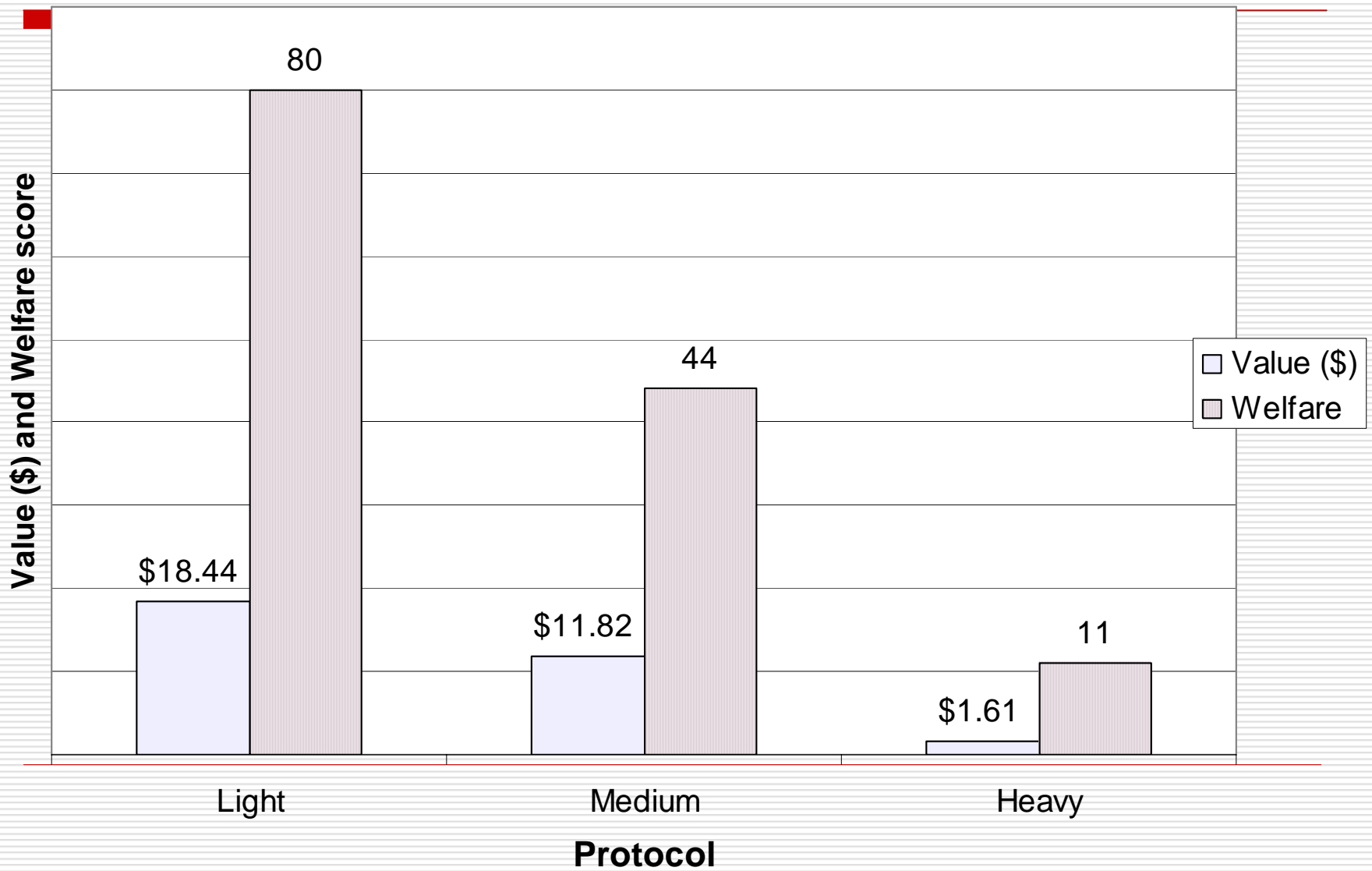


Figure 2. Expected Value (\$) and Welfare Costs by Protocol



Decision Tree, light protocol

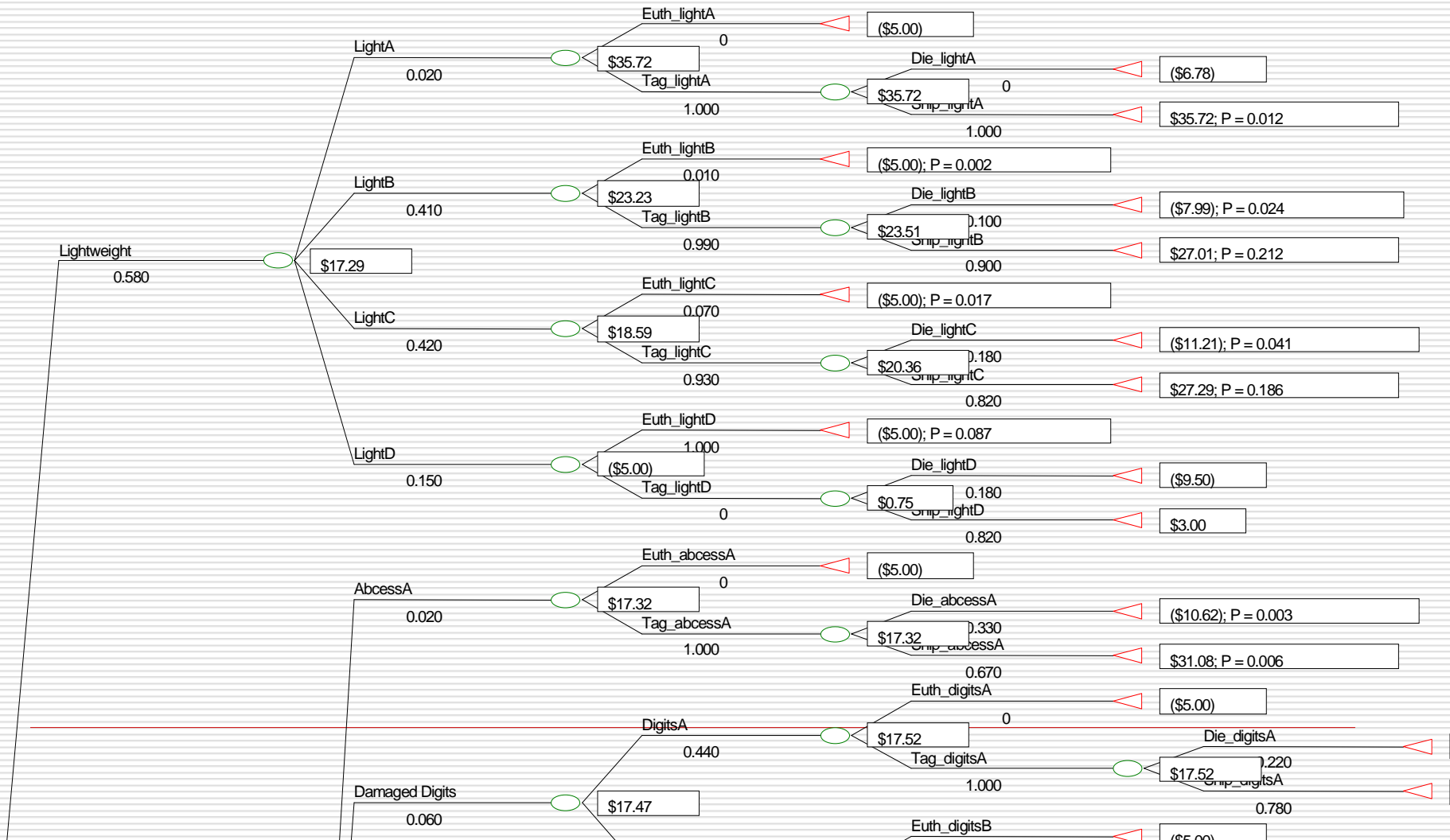


Figure 3A. Sensitivity of value (\$) to the proportion of light-weight pigs

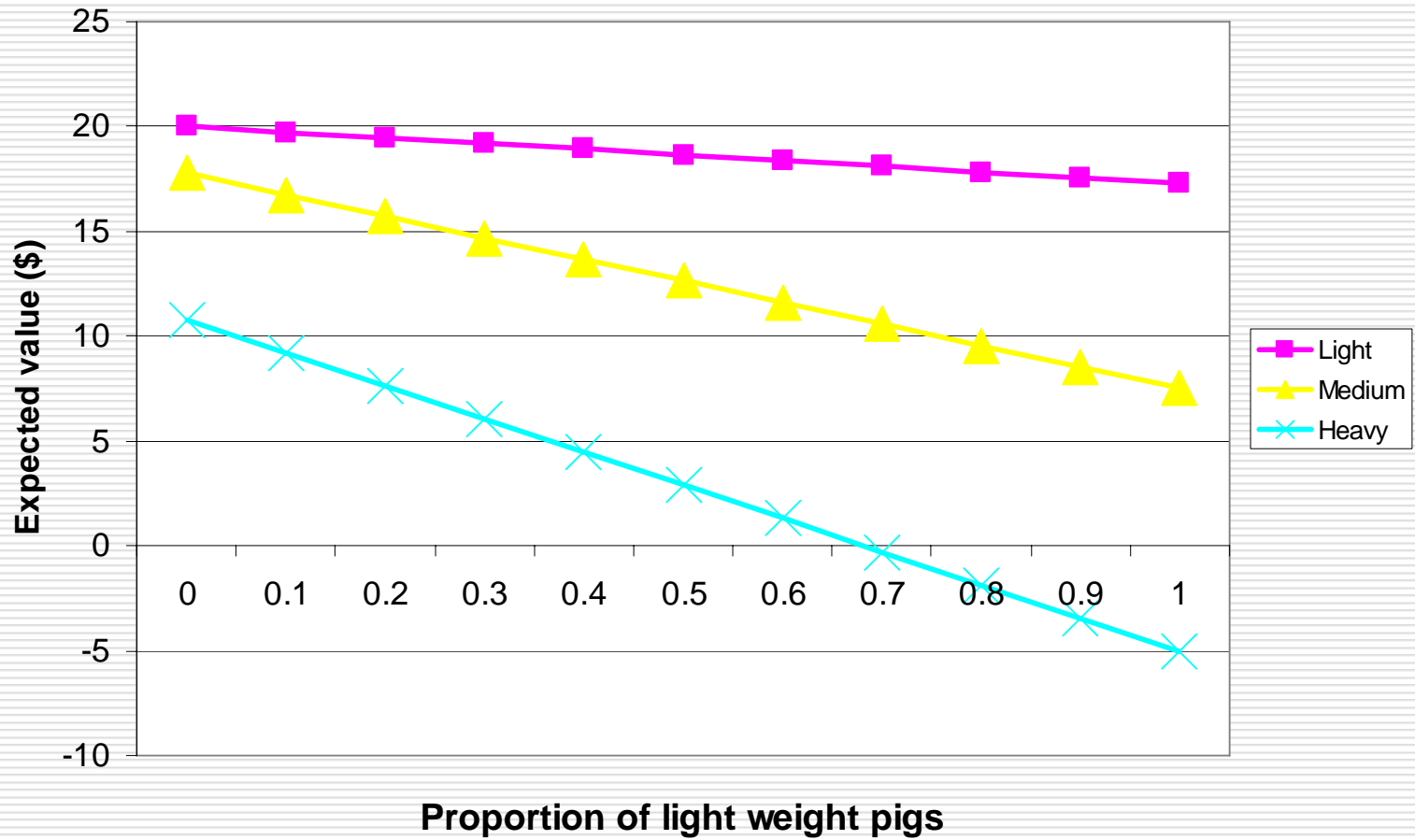


Figure 3B. Sensitivity of welfare score to the proportion of light-weight pigs

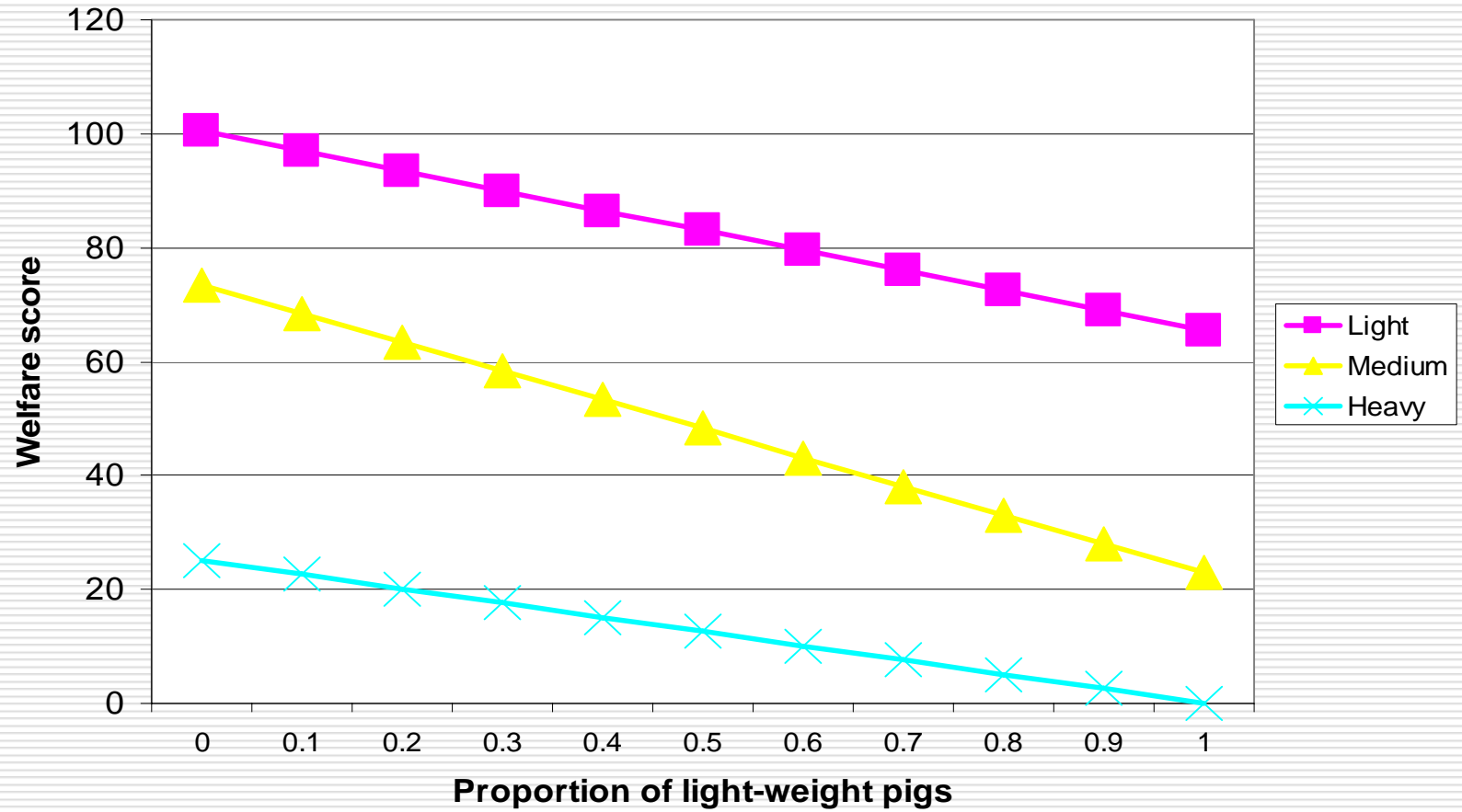


Figure 4A. Sensitivity of value (\$) to the proportion of lame pigs

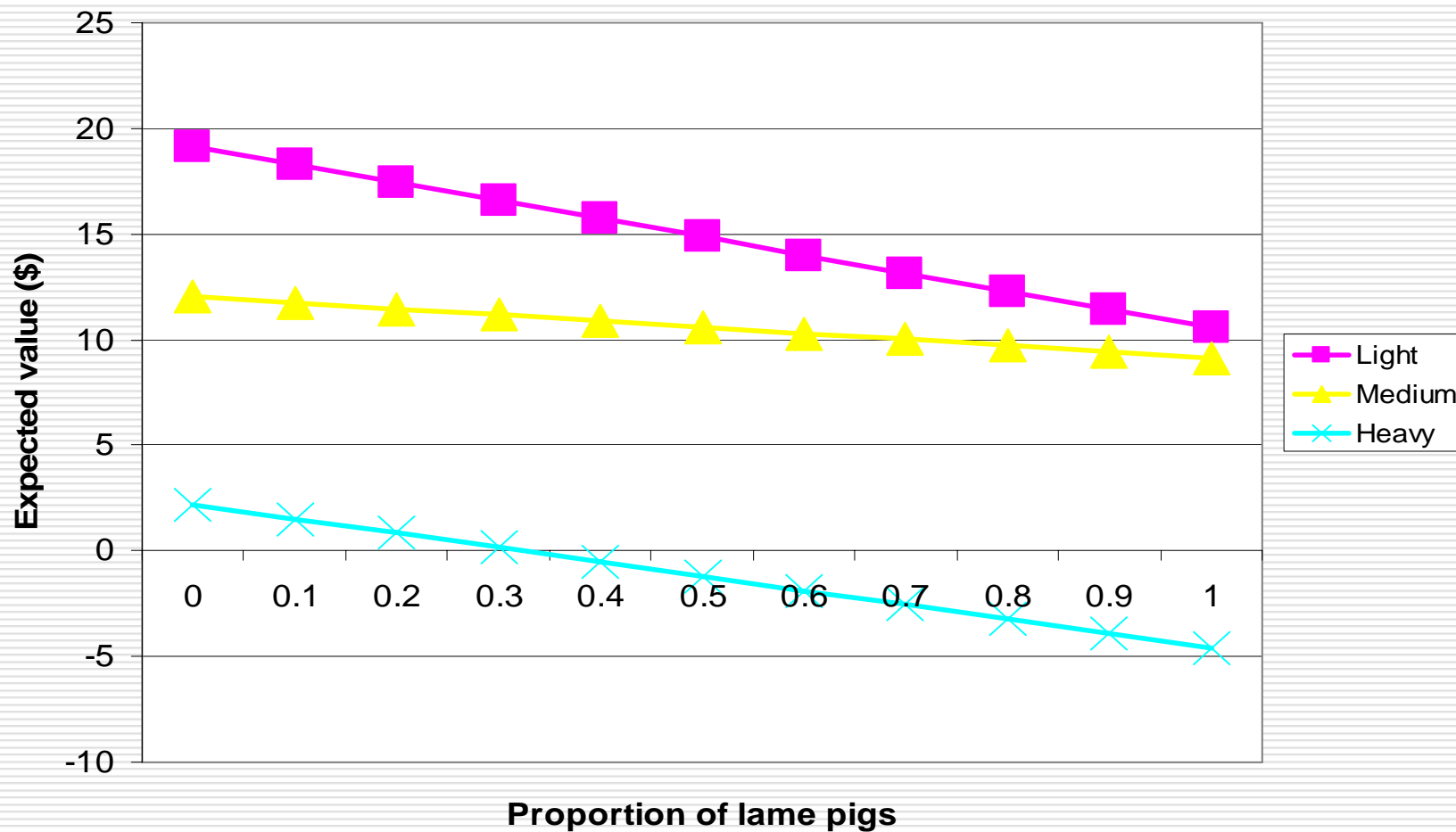
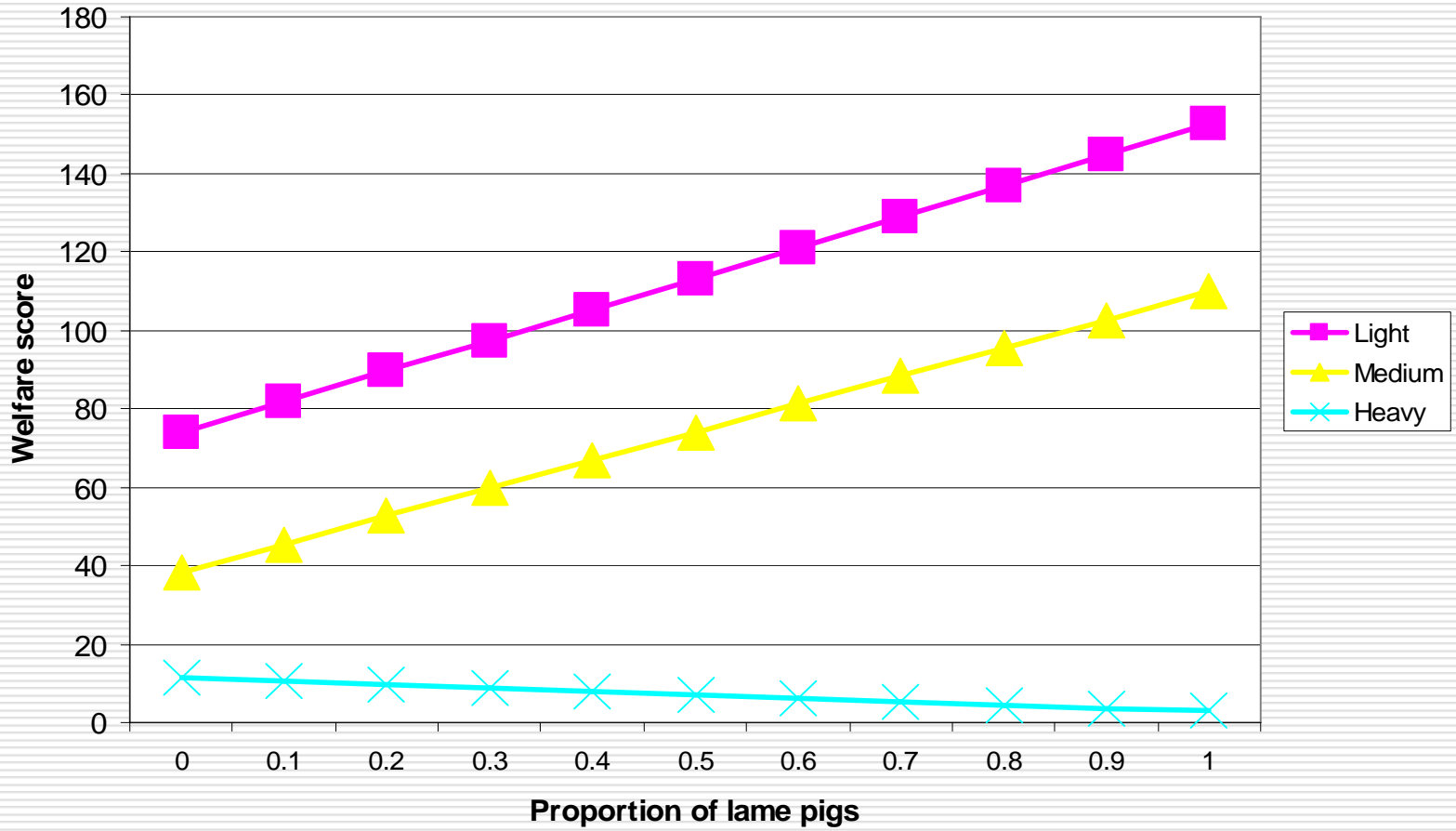


Figure 4B. Sensitivity of welfare score to the proportion of lame pigs



The Take Home Message

- By euthanizing more casualty nursery pigs on arrival managers can improve the welfare status of the farm.
 - After adopting the light euthanasia protocol, pigs that are weak, lame, with 2 or more conditions or prolapsed have a low value and high welfare score and managers can increase farm welfare at least cost by immediately euthanizing most of these pigs.
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The Take Home Message

- As more pigs are euthanized (progressing from light, medium, to heavy) the value of casualty pigs decreases 11 fold (\$18.44 to \$1.61) but welfare improves 7 fold (score 80 to 11)
 - Farms vary in the prevalence of casualty conditions and managers need to focus on the conditions on their farms and adjust their protocol accordingly.
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