A Study of the Relationship between Horse Slaughter and Reported Cases of Abuse and Neglect

John M. Holland – 23 January, 2006

The "Unwanted Horse" Theory

The "unwanted horse" theory is the single most frequently sited argument in support of horse slaughter in the United States. This theory contends that there are more horses produced in the United States each year than are needed for recreational, sport, and other non-slaughter purposes. The theory then contends that horse slaughter acts as a "relief valve" and that if it were not for this channel these unwanted horses would begin accumulating. The theory goes on to warn that these horses would be neglected and abused unless the government stepped in to rescue them.

As an argument in favor of horse slaughter, this theory has two distinct advantages. The first advantage is that at face value the theory seems very plausible, as the numbers of horses being slaughtered sound so large that it is hard to imagine how they might be absorbed if slaughter were ended.

The second great advantage is that the theory allows the person or organization using it to claim that by opposing a ban on horse slaughter, they are really doing what is best for the horses. This is particularly important for organizations such as the AQHA (American Quarter Horse Assoc.), AVMA (American Veterinary Medical Assoc.) and AAEP (American Assoc. of Equine Practitioners), who are expected to represent the best interests of the species, and for politicians who don't wish to lose the support of animal-friendly constituents. But is the theory supported by the evidence?

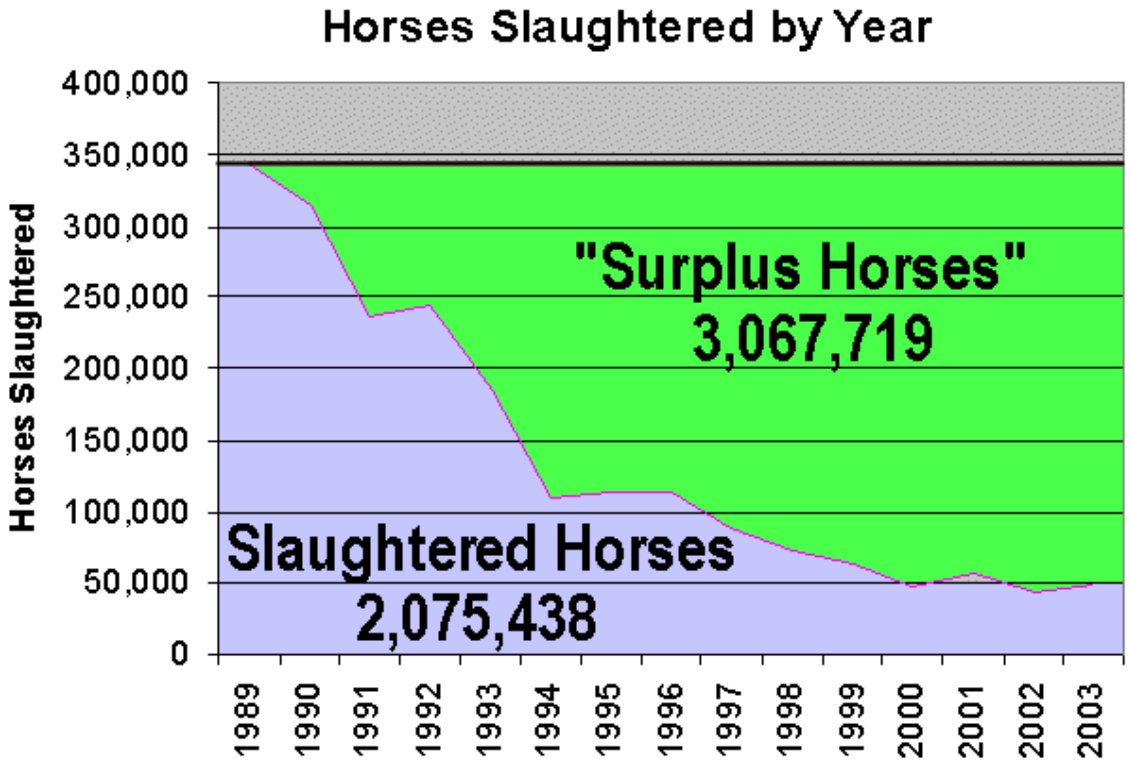
Looking Closer

The first contraindication to the unwanted horse theory is the realization that as large as the annual horse slaughter numbers appear, they represent only about 1% of the horse population in the United States. It is rare that a population of any kind cannot absorb such a small increase or decrease in supply. This is just the first of many bits of negative evidence.

One proponent of horse slaughter, Representative Bob Goodlatte of Virginia, has gone so far as to circulate a letter[1] to his colleagues in the House of Representatives actually projecting the number of surplus horses that will accumulate in the decade following an end to slaughter, and estimating the cost to the government of warehousing these horses to be $530 million by 2016. In making this prediction, Goodlatte was using the assumption of a constant rate of production of unwanted horses. This is the easiest version of the "unwanted horse theory" to dispel.

The graph "Horses Slaughtered by Year"[2] is a test case for the concept that there are a relatively constant number of unwanted horses produced each year. Had we made the assumption in 1989 that the number of horses killed that year were still going to be produced in future years (the black line), we would have experienced an almost

continuous drop in slaughter for the next decade and we would have found that by the end of 2003 there were over three million surplus horses unaccounted for. Clearly these horses were simply absorbed into the population.



Under the theory, the only explanation for these missing "surplus horses" would be that the horse population as a whole had been declining during this period and that the number of surplus horses was not a constant, but rather a fixed percentage of the population. The fixed percentage argument is clearly more reasonable than the fixed number hypothesis.

A search of available population data shows that there is no one set of complete numbers, but Freeman[3] took all the available studies and statistics and estimated that during this period horse populations were in fact *rising* at a 3 to 5% rate per year. If this were taken into account in the graph above, the horizontal black line should be rising across the chart to over 500,000 horses per year by the end of 2003 (3% per year compounded), and this would result in far more than 3 million "surplus" horses for the period.

There are indeed more horses in the population, but there has been no government welfare program for these horses, no cost to the taxpayers, and no flood of homeless horses. Again, even with the most conservative assumptions the theory of a constant source of unwanted horses is completely discredited.

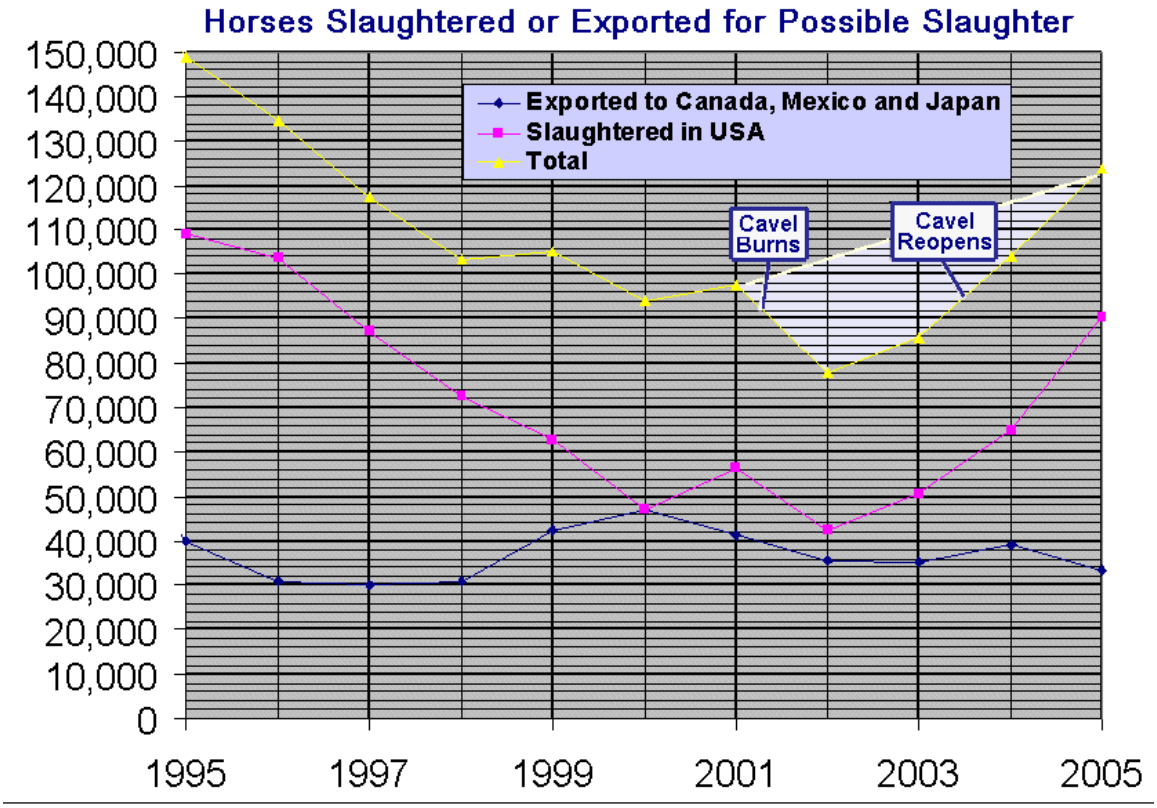
Faced with this evidence, the proponents of the unwanted horse theory quickly replaced the static supply model with an adaptive model which holds that the rate of slaughter

adapts to the number of unwanted horses and thus it will vary from year to year. This model neglects a more straight forward explanation for the drop in slaughter numbers shown above, which is that most of the original 12 horse slaughter houses in operation in 1989 most closed due to lack of demand over the course of the 1990s. The dynamic model would also seem to be conveniently untestable except for the availability of some interesting data surrounding an event that occurred in 2002.

Testing the Dynamic Model

The dynamic model assumes that the slaughter industry is for the most part adjusting its slaughter rate to absorb the unwanted horses through some inverse version of the law of supply and demand. If this were true, then a sudden and significant drop in slaughter capacity would throw the balance out because the industry could not adjust immediately to the surplus of unwanted horses. As luck would have it, just such an event occurred on Easter Sunday of 2002 when the Cavel slaughter plant in DeKalb Illinois burned to the ground.

By the time of Cavel burning, only three slaughter plants were operating in the United States and the rate of slaughter was back on the increase. The three plants had slaughtered 56,332 horses in 2001, but with Cavel off line for eight months of 2002, that number decreased to 42,312. By 2003 the two remaining plants had stepped up production to take up some of the slack.



In the graph "Horses Slaughtered or Exported for Possible Slaughter" the numbers of horses exported to Canada, Mexico, and Japan have been added to the number slaughtered in the United States. This sum is shown in yellow on the top curve of the graph. This line represents all horses possibly slaughtered from the United States. Again, by assuming that all horses exported to these three countries were slaughtered we are making the most conservative assumption. In reality current statistics show that this assumption is quite accurate and over 90% of the horses exported to these countries typically do go to slaughter.

What makes the closing and reopening of Cavel interesting is that there are solid statistics on the number of abuse and neglect cases in Illinois around this period. The other element that makes for an ideal test is that the remaining slaughter capacity was then almost 1,000 miles away in Texas. This meant that the "unwanted" horses from the Illinois area would be less attractive to killer buyers because they would have to transport them either to Texas or over the borders to Canada or Mexico. Proponents of the theory have attempted to explain what happened after Cavel burned by claiming that the surplus horses from Illinois were probably sent to these places. This is not the case as the "Horses Slaughtered or Exported for Possible Slaughter" [4] clearly shows.

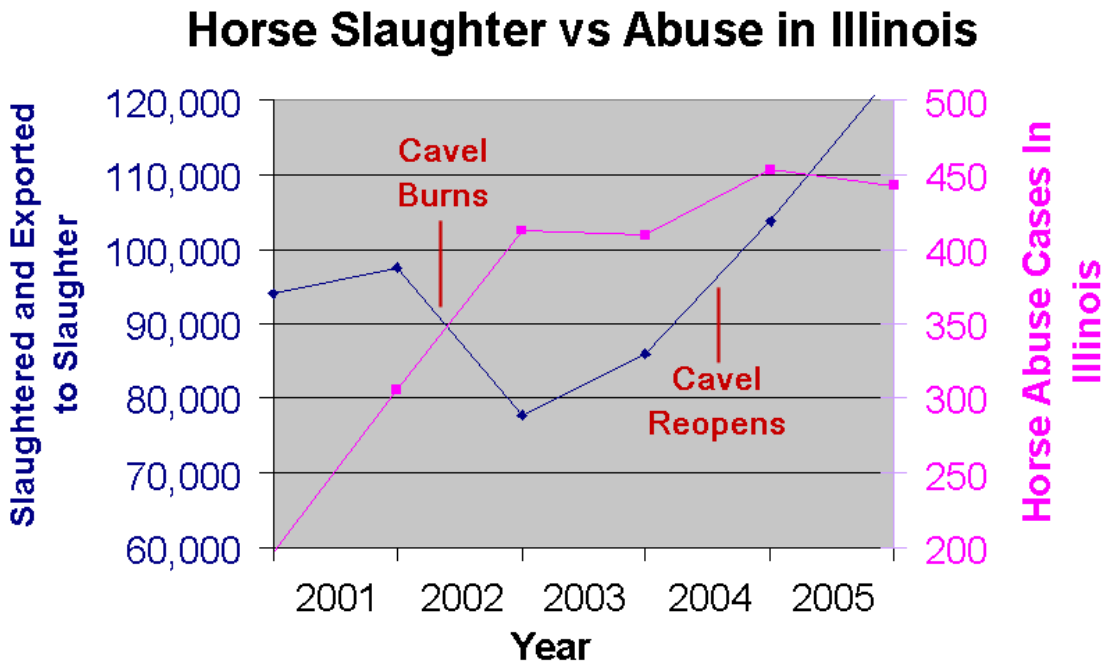
Assumptions

We have clearly established that the bulk of the horses that would have been slaughtered by Cavel in the period between its burning and reopening were not sent elsewhere for slaughter. It could reasonably be argued that the rate of slaughter of Illinois horses probably dropped nearly to zero after the burning. At the very least Illinois horses were much less likely to be slaughtered than those from states in closer proximity to Texas. However, the calculations that follow are based on the extremely conservative assumption that the horses slaughtered during this period continued to be drawn from Illinois at the same proportion they had been when Cavel was operating.

It is clear that between 2000 and 2001 the rate of slaughter was on the increase, and that had Cavel not burned it appears that this line representing horses slaughtered and exported would have continued upward to the 122,000 level it reached in 2005 when Cavel was back in full operation the whole year.

Therefore, any mechanism the plants might have for adjusting to the supply of unwanted horses clearly could not operate fast enough to keep over 20,000 horses from falling through the cracks in 2002, and a similar number in 2003. The lighter shaded area therefore represents horses that should have been surplus from this event according to the unwanted horse theory.

To study the effect of this disturbance in processing capacity on the rate of abuse and neglect it is useful to plot the abuse rate[5] against the slaughter rate.



According to the unwanted horse theory one would not expect the effect of a loss of slaughter capacity to be immediate. Instead, this effect should grow as the unwanted horses accumulated. The first thing one notices about the above graph is that this clearly is not the case. Between 2000 and 2001, both slaughter and neglect were increasing. According to the unwanted horse theory, this would indicate that horses were either not being slaughtered in sufficient numbers (unwanted horses were accumulating), or that there was some additional causation for the increasing abuse and neglect. For the year in which Cavel burned, the rate of slaughter diminished, and abuse continued to rise at the same rate it had been increasing before the fire. To some extent this can be explained by the fact that not enough additional unwanted horses had accumulated to have an effect in eight months since the plant burned.

In this case, however, we would certainly expect abuse to have increased rapidly by the end of 2003, but instead of rising abruptly, the rate of abuse actually stopped increasing and began dropping slightly. These are simply visual observations that call the unwanted horse theory into question. The real question remains as to whether we can numerically show any confirmation of the theory that abuse and neglect should increase as unwanted horses accumulate.

The Search for the Factor

If the theory that horse slaughter relieves abuse and neglect were true, then we should be able to find a factor by which these two things were related in the window of time just discussed. Furthermore this factor should be negative. For example, if we found a factor of -2, then we could predict that if we increased horse slaughter by 1%, the abuse rate should drop by 2%. Conversely, if we decreased horse slaughter by 1%, abuse and neglect should increase by 2%.

Four formulas were used to attempt to find this magic factor that would quantify the abuse and neglect relationship. The first formula related each year's percentage change in abuse to the percentage change in slaughter for the previous year. This simple rule allows that the accumulation or reduction of unwanted horses will begin to at least have some effect by the next year. When this calculation is done for each year, and the five yearly factors are averaged, the result is a *positive* factor of 1.04. In other words, this factor predicts that if we increase slaughter by 1% in a given year, we can on average expect a 1.04% *increase* in abuse the next year. This clearly contradicts the unwanted horse theory.

The second formula used related the percentage change in abuse in any given year to the percentage change in slaughter in that same year. The five yearly factors were then averaged and the result was again a *positive* factor, but this time of 2.73. In other words, if we reduced slaughter by 1%, we could expect abuse to *go down* by 2.73%. This is again in contradiction to the theory.

A third formula was applied. This formula was based on the percent change of each year with respect to the base year of 2000. This formula also yielded a *positive* factor of 2.54! In all three cases the attempt to derive a relationship between changes in the rate of slaughter and changes in the rate of abuse yields a result in opposition to the theory that slaughter relieves abuse.

A fourth test was applied to the numbers based on the calculation of the approximate number of accumulated unslaughtered horses each year due to the drop in processing capacity. The slope of the resulting curve was not monotonic as would be predicted by the "unwanted horse" theory. In the year before the fire and before any horses accumulated, the abuse rate increased by the same magnitude as it did when the accumulation went from zero to an estimated 20,600 at the end of the year Cavel closed. Then, when in the next year the number of unslaughtered horses doubled to 41,000, the abuse rate actually dropped. As before, no meaningful relationship could be drawn from the data.

Conclusions

The theory that reducing horse slaughter increases abuse and neglect is clearly not supported by the data. On its face, the data would seem to make the case that slaughter has just the opposite effect on the number of cases of abuse and neglect. There may be some truth to this because the brokers and feedlot operators who deal in slaughter horses are not known for their stewardship of the animals (to be polite). The fact is, however, that all attempts to calculate a relationship between abuse and neglect generate widely disparate values year to year which indicate that the there is probably no meaningful relationship at all, or that if it exists it is insignificant compared to other factors.

The reason this is true is undoubtedly multi-fold. As previously mentioned, the number of horses being slaughtered annually represents only 1% of the horse population, so their fate has little effect on the overall situation. Neglect is probably more dependent upon larger factors such as weather (forage and hay availability), and the state of the economy.

Additionally, since the slaughter industry processes only horses that are in good flesh, and generally under twelve years of age and since blind horses and horses that cannot support their weight on all four legs are banned from transport, it would seem that the horses being removed from the population through slaughter are not the ones being abused and probably not the ones at highest risk of abuse or neglect.

Finally, a market place is not an "open loop" system by nature. That is, the supply of a commodity does not remain unrelated to its demand. If there is a demand for horses of a certain type (e.g. "loose horses"), then the market will provide them. For a commodity whose supply is fundamentally unlimited, supply would be expected to follow demand and not the other way around as the "unwanted horse" theory proposes.

In short, the theory that horse slaughter has a beneficial effect on the rate of abuse and neglect is clearly disproved by the facts. For reputable institutions to continue to depend on this theory as a justification for supporting horse slaughter is at best unjustified and irresponsible.

About the Author

John Holland is an industrial consultant in the field of intelligent automation and knowledge engineering. He is the author of three books with his most recent work being "Designing Autonomous Mobile Robots; Inside the Mind of an Intelligent Machine". He also holds numerous patents in robotics, fiber optics, and radio telemetry.

Mr. Holland is an advocate for horse welfare and humane treatment. In 2005 he received the annual "Heart and Soul" award from United Animal Nations for his volunteer work against horse slaughter. He lives with his wife Sheilah and their ten horses in the mountains of Southwest Virginia.

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