Results of a Contingent Valuation Survey to Evaluate the Breeding Objective for the South German Heavy Horse

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Introduction

The last few years there has been a growing interest in developing strategies to include modern animal breeding techniques into the more or less traditional breeding of the South German Heavy Horse. Among others this attempt requires a well defined breeding objective reflecting the preferences and needs of the majority of the breeders. Since only few if any of the breeders are motivated by economical considerations, the general approach for defining weights by calculating marginal profits is not strictly valid in this case. Since there is more or less no information about market prices, derivations of marginal profits is hardly feasible anyway. In this investigation our main interest was to derive weighing factors for all relevant conformation and performance traits of the South German Heavy Horse by using a method based on welfare economic theory, the Contingent Valuation (CV) method.

1. Material and methods

1.1. The Contingent Valuation Method

The Contingent Valuation method uses survey questions to elicit peoples' preferences for public goods by finding out what they would be willing to pay for specified improvements in them. The method is thus aimed at eliciting their willingness to pay (WTP) in money amounts [MITCHELL and CARSON, 1989]. To do so it uses a detailed description of the good and the hypothetical circumstances under which it is made available. This information has to be sufficient to facilitate the valuation process for the respondent without biasing the results. CV-studies are typically used in public policy decision making, in the absence of observable markets for the good in question. It is a valuable and accepted tool in that context. There also have been attempts to use this method in the field of animal breeding, mainly to derive (economic) weights for traits like meet quality or to valuate aspects of animal welfare [OLESEN, GJERDE und GROEN, 1999; ROHR, HOFER und KÜNZI, 1999] . In the latter cases such traits have been successfully included in the breeding objectives.

1.2. The Survey Instrument

In this survey, only traits that are part of the regular performance tests used in the breeding of the South German Heavy Horse were accounted for. These include among others conformational traits like the general conformation, type, correctness of legs and hoofing and the quality of walk and trot as judged in the breeding registrations for studs and stallions. Additional performance traits measured in the regular performance tests for studs and stallions were also included. Thus a total of 15 traits were covered. In performance tests these traits are subjectively scored on a scale reaching from 1 "very bad" to 10 "excellent". Grade 6 "satisfying" can be considered as population mean for all traits. Since most breeders are very active in visiting the breeding registrations and performance tests it has been assumed that the scores and the differences in quality coded by them are known to the breeders. It was not our intention to discuss the advantages and disadvantages of this scoring procedure.

In our survey a decomposition strategy was followed. The respondents were first asked to value a stud, four years of age with a quality corresponding to grade 6 in all traits considered. In traits like colour and height the respondent was asked to assume a total agreement with his preferences. He was then asked to state his maximum price for a stud of the same age, identical in colour and height but of a quality corresponding to grade 7 ("fairly good").

Following up, the respondent should then allocate the difference between the values of grade 6 and grade 7 to the particular traits in question. It was assumed that obtaining a total amount first (in this case a difference) will help the respondent to grasp the idea that the values spent for the particular traits have to be a subset of the overall value. To facilitate the valuation process further, a visual aid in form of a modified "game-board" with play money was used. With the help of that device the respondent thus had a permanent visual control about his decisions.
This valuation scenario was extended by additional survey components, evaluating the respondent's attitude to breeding in general and to collect information about the socio-economic characteristics of the respondent.
Before utilisation the methodology was tested on a small sample of members of the executive board of the breeding society concerned.

1.3. The Sample
As the target population, all actual members of the breed society of South German Heavy Horse were defined. The sampled population was a reduction to those breeders owning a registered and active breeding mare or stud by the time the survey was developed (N=969). From this population a stratified random sample of 67 breeders was drawn. Stratification accounted for three regional breeding associations and the number of breeding animals owned by the breeders (2 classes: ≤2 or >2 breeding animals). In addition a separate stratum for stallion owners was defined.

1.4. The Conduction
The sampled breeders were phoned and asked for participation using a standardized text. The information given was quite small to make sure that global non responses have no biasing effect in form of a sample selection. Breeders that agreed to participate were visited and interviewed (face to face).

2. Results
A total of 62 personal interviews with an average duration of about one hour were carried out and analysed. The following gives an outline of the major results.

2.1. Basic Values
The results of the questions evaluating the basic amounts and their differences as explained above are summarized in table 1.

table 1. *Base amounts and their differences in €*

Variable	N	Mean	Trimmed	Winsorized	Min.	Max
Animal grade 6	62	2343 ± 57	2357	2345	1500	3200
Animal grade 7	62	3184 ± 81	3176	3190	1800	5000
Animal grade 8	62	4306 ± 180	4170	4234	2000	10000
Difference grade 7-6	62	841 ± 44	--	--	300	2000
Difference grade 8-7	62	1122 ± 136	--	--	0	6000

(Robust estimators: discounting 10% extreme observations on each tail of the distribution)

The observed extreme values are no exceptional events although robust estimators show that they have no great influence on the mean. Valuation questions for an animal graded 8 ("good") in all relevant traits were included to give an idea of the linearity of differences depending on grades. As can be seen the standard errors tend to be larger with higher grades, also the differences between subsequent grades are spread out. This reflects that a stud grade 8 in all traits is a rare thing (given the distribution of notes in the population). Also the

breeders vary heavily in their engagement and their willingness and ability to spend money for such a breeding animal. The standard errors of the differences indicate that there is a considerable positive correlation between the basic amounts.

2.2. Results of the Allocation Process

The difference between WTP-amounts for animals graded 6 and 7 given by each respondent was handed out to him in units of play money. He was then asked in a first step to allocate this amount to the two performance tests. This was because each test can be seen as representing a special group of traits, conformational traits on one hand, performance and character traits on the other. In a second step he should then allocate this money to the individual traits in question. The results of this two-step allocation process are summarized in table 2.

table 2. *Overview of the results of the allocation to individual traits*

	Traits	Relative*	In Euro**
„Conformation“	Quality of the legs	0.23	91
	Walk	0.19	75
	Correctness of gaits	0.18	71
	Conformation	0.16	63
	Trot	0.13	51
	Type	0.11	44
Conformation : Performance		0.47 : 0.53	395 : 446
„Performance and Character“	Pleasantness	0.17	76
	Coolness	0.17	76
	Willingness to work	0.15	67
	Driving ability	0.14	62
	Draught ability	0.12	54
	Concentration	0.12	54
	Walk (one-horse carriage)	0.08	36
	Trot (one-horse carriage)	0.05	22

* all allocations s.e. < 0.01

** based on the mean difference between the WTP-amounts for animals grade 6 and 7 of 841 €

All results shown are unweighted calculations of means. Possible weighings resulting from stratification (accounting for the percentage of breeders or breeding animals in each stratum) were tested and showed no influence on the estimates.

2.3. Further Results

2.3.1. Colour and Height Preferences

In his valuations the respondent was asked to assume a complete agreement between his colour and height preferences and the animal in question. In this part of the survey these preferences were assessed. Results are given in tables 3 and 4.

table 3. *Respondents' colour preferences*

Colour	Respondents
Dark chestnut / white mane and tail	34 (55%)
Chestnut / white mane and tail	3 (5%)
Bay	20 (32%)
Black	1
No preference	4

table 4. *Respondents height preferences (studs, height at withers)*

	μ ± s.e.
Mean preference	162.7 ± 0.2
Limit for registration	166.9 ± 0.3

Asked for an upper limit for height for registration, only 10% of all respondents were arguing against such a limit. All other respondents regarded such a limit as useful for preserving typical height characteristics of the breed.

2.3.2. Breeders' Criteria for Selecting a Stallion

Respondents were asked to give their personal criteria for choosing a registered stallion for serving. Results are as follows:

Character > Ancestry > Colour > Height > …

Further questions revealed another criterion of greatest importance. More than two third of all respondents showed a strong commitment to their local or regional private or cooperative stallion owners. Since natural service is the rule and artificial insemination plays only a minor role this practice offers apparent logistic advantages. But there is an additional reason. A great percentage of all services are made by stallions after their registration but before their performance test judging the character traits. Therefore the breeders have to rely on other sources of information about the character qualities of a stallion. It is the familiarity with and the trust on the local stallion owner (and their stallions) that is the crucial motive for that practice.

3. Discussion

The CV-method used in this investigation and the survey instrument designed had both proven to be successful in revealing general insights into the motivation and the preferences of the breeders. All breeders were able to perform the task. Further, although the sample evaluated was quite small, the results of the allocation process show a remarkably stable preference structure across all strata. We have no reason to doubt the validity of the results. The high weights for what can be seen as typical qualities of the South German Heavy Horse breed like a good character and a good walk are very reasonable. Further, since the quality of hoofing and legs is considered to be a well known problem in heavy horse breeds it is not surprising that this trait got the highest weight in this investigation.

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