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EVALUATION OF TEMPERAMENT TESTS IN BEEF STEERS

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Abstract

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The aim of the study was to evaluate three times repetited measurements of the beef steers temperament using of the Scale Test (1–5 score from docile to wild) and the Flight Speed Test (the time taken to cover a set distance of 1.7 m after leaving the weight scale in tenths of a second). Ten Charolais and 10 Hungarian Grey steers were used. At the start of testing, the Charolais and Hungarian Grey steers aged 446 and 487 days, respectively, while the following measurements were realized at their average age of 553 and 594 days, respectively and of 713 and 754 days, respectively. The mean temperament scores revealed that temperament was fairly consistent in Hungarian Grey steers (1.3–1.4–1.4) and it worsened in Charolais ones only on the third measurement (1.6–1.5–2.5). Flight speed varied non-significantly in Charolais (2.77–2.89–2.46 s) and in Hungarian Grey (4.09–5.01–5.33 s) steers either through the study. In our opinion, the successive use of the Scale Test and the Flight Speed Test can offer a more reliable measure of cattle temperament when the sample is small.

temperament, Scale Test, Flight Speed test, beef steers

The temperament of cattle has profound effects on the way they respond to management practices and it implies important consequences on animal welfare, product (meat) quality, and human safe. Temperament, i.e., the way cattle react to handling events, is believed to be influenced by genetic and environmental factors, such as rearing management and previous handling (Fisher et al., 2000). Temperament is at least moderately heritable (Burrow, 1997) and previous studies have indicated a genetic potential for selecting beef cattle for calm temperament (Le Neindre et al., 1995; Burrow and Corbet, 2000). However, the selection for this trait requires measures of cattle temperament in a meaningful, practical and repeatable way.

Previous studies testing temperament in beef cattle have often used subjective scoring of animal behaviour, e.g., the Crush Test (Tulloh, 1961; Grandin, 1993) or the Scale Test (Sato, 1981; Kabuga and Appiah, 1992). Such measures can be useful to discriminate between grossly different temperaments, or for a single observer to conduct all measurements. Objective measures are reportedly the Docility Test (Le Neindre et al., 1995) and the Flight Speed Test (Burrow et al., 1988), but these require specialised electronic equipment and/or software. The aim of this study was to evaluate the reproducibility of three potential measures of cattle temperament using the Scale Test and the Fight Speed Test.

MATERIAL AND METHODS

The study was carried out in years 2002–2003, and utilised 10 Charolais (CH: a terminal beef genotype) and 10 Hungarian Grey (HG: an indigenous Hungarian breed) steers, reared in a highland farm. Animals were born in the winter and spring calving seasons (January–May) in stable. Because the Hungarian

Grey is a hardy breed with slow growth intensity and the calves are on the pasture with their mothers until yearling age, all animals had been transferred to the experimental farm and castrated at 14 months of age. The adaptation period was 2 months. Castration was carried out for improvement of quality of meat. Daily gains until the beginning of the test were 1.04 kg for CH and 0.78 kg for HG ($P < 0.01$). At the start of the testing the CH and HG steers were 446 and 487 days of age, respectively. Animals were kept on deep litter in a stable, that was provided with an open yard. Their feed was meadow hay (ad libitum), maize silage (5 kg/day) and concentrate (3 kg/day). The animals were handled by the same breeder. Health condition and nutritional status of all animals under study were good during the whole study period. The experimental farm is located in North–East Hungary, with climate parameters described in Table I.

I: *Climate at the farm area*

Parameters	Values
Altitude (m)	230
Annual precipitation (mm)	656
Average temperature in winter (°C)	0.2
Average temperature in spring (°C)	9.8
Average temperature in summer (°C)	20.1
Average temperature in autumn (°C)	8.9

Temperament was measured in two successive tests as it was suggested by Trillat at al. (2000). In the Scale Test animals were confied in a weight scale for 30 s meanwhile behaviours were assessed in a 5-score system: 1) calm, no movement, 2) calm with occasional movements, 3) calm with some more movements but without shaking the scale, 4) abrupt episodic movements without shaking the scale, 5) permanent episodic movements and shaking the scale. With the Flight Speed Test, the time for an animal to cover a set distance of 1.7 m after leaving the weight scale was recorded in tenths of a second. The tests were assisted by video-recording and stop watching. Each test was conducted on three occasions, separated by 107 and 160 days, respectively (Table II). Data were statistically evaluated by program SPS 10 (ANOVA, Friedman test).

II: *Presentation of experimental groups by age and body weight throughout the study*

Tests	Breed	(N)	Age (day)	Live weight (kg)
1st	CH	(10)	446 ± 26	453 ± 35
	HG	(10)	487 ± 69	371 ± 27
2nd	CH	(10)	553 ± 26	575 ± 39
	HG	(10)	594 ± 69	476 ± 40
3rd	CH	(10)	713 ± 26	661 ± 45
	HG	(10)	754 ± 69	570 ± 58

RESULTS AND DISCUSSION

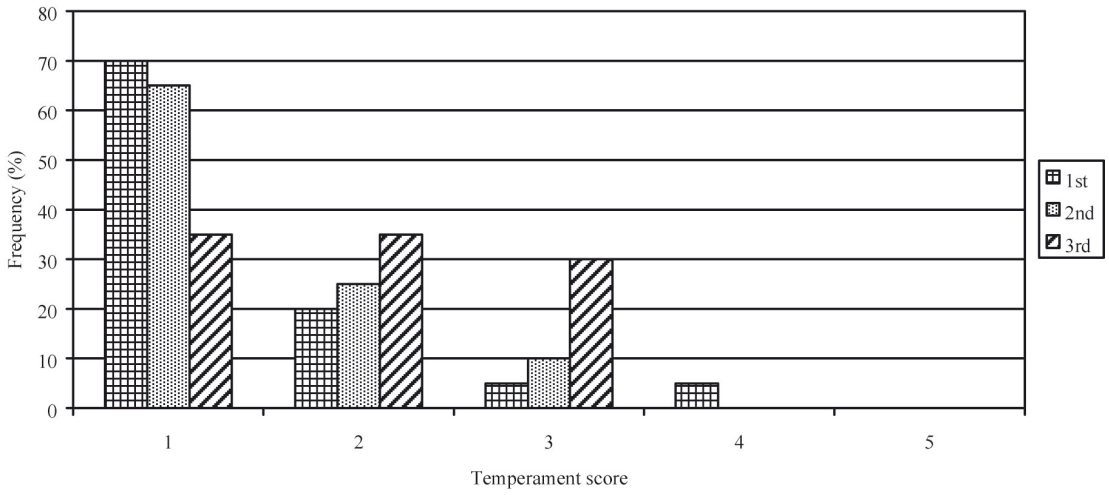
Table III. presents the ranges and means for temperament score and flight distance obtained across all three measurement occasions combined, and for each separate measurement occasion. Taking the combined means, HG steers proved calmer than CH ones concerned temperament score (1.36 versus 1.86) and flight speed (4.81 s versus 2.71 s). The mean temperament score recorded on separate occasions seemed fairly consistent in HG steers (1.3–1.4–1.4) and it worsened in CH steers only on the third measurement occasion (1.6–1.5–2.5). The difference was due to a higher individual variation in the temperament scores recorded for CH steers. The mean flight speed records showed non-significant between-measurement variation in CH steers (2.77–2.89–2.46 s) and HG ones (4.09–5.01–5.33) either.

III: *Ranges and means for Scale Test and Flight Speed Test of temperament obtained in beef steers*

Test	(N)	Temperament Score		Flight Speed (s)	
		CH	HG	CH	HG
Overall					
Minimum	(30)	1	1	1.41	2.40
Maximum	(30)	4	3	4.92	12.40
Mean±SD	(30)	1.9 ± 0.9	1.4 ± 0.6	2.7 ± 0.8	4.8 ± 2.0
Individual tests					
Mean±SD (test 1)	(10)	1.6 ± 1.1	1.3 ± 0.5	2.77 ± 1.3	4.09 ± 1.4
Mean±SD (test 2)	(10)	1.5 ± 0.7	1.4 ± 0.7	2.89 ± 0.6	5.01 ± 1.7
Mean±SD (test 3)	(10)	2.5 ± 0.7	1.4 ± 0.5	2.46 ± 0.4	5.33 ± 2.7

The Friedman test revealed a significant between-measurement difference in the temperament scores for CH steers (test result: 11.667; $P < 0.005$), whereas the corresponding difference was non-significant in HG steers (test result: 0.25; $P > 0.10$). No significant between-measurement difference was found in the flight speed records for CH or HG steers either (test result for CH, HG: 4.200; $P > 0.10$).

Overall, the Flight Speed Test offered a higher reproducibility in steers compared to the Scale Test that enabled the same observer to discriminate between grossly different temperaments (Figs. 1–2). However, our sample was small.



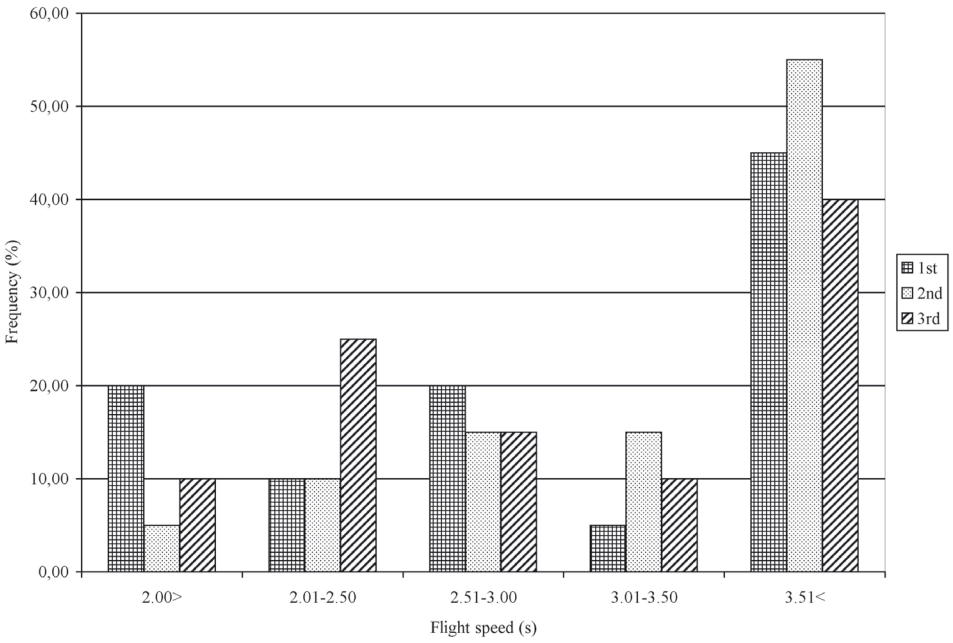
1: *Percentage distribution of steers (n = 20) by 1–5 temperament scores on each separate measurement occasion*

Grandin (1992) also demonstrated that the most quiet and most nervous individuals showed a fairly consistent temperament in repeated tests. Burrow and Corbet (2000) recommended to conduct the tests on several occasions (e.g., at age of 6, 12 and 18 months) so as to select beef cattle successfully for calm temperament. Fisher et al. (2000) evaluated three measures of cattle temperament, separated by one month, adopting the Flight Distance (in paddock and yard) and the Sociability Test.

In our study, we conducted the temperament tests in steers on three occasions, separated by a longer interval (107 and 160 days). Thus, the results showed rather the consistency of temperament with ageing than repeatability of temperament.

CONCLUSION

The use of the Scale Test and the Flight Speed Test offer a suitable tool for measuring temperament of cattle, easy to implement in the farm. We think reasonably to conduct these two tests on repeated occasions to obtain a more reliable measure of cattle temperament when the sample is small.



2: *Percentage distribution of steers (n = 20) by the flight speed records on each separate measurement occasion*

SOUHRN

Zhodnocení testů temperamentů u volků masných plemen

Cílem sledování bylo zhodnotit temperament volků masných plemen Charolais (CH) a Maďarského šedého skotu (MŠS) při aplikaci Scale testu a Flight Speed testu. Do sledování bylo zařazeno 10 volků plemene CH a 10 volků plemene MŠS. Kastrace všech sledovaných volků byla provedena ve věku 14 měsíců s cílem zlepšení kvality masa. Výkrm sledovaných volků byl realizován ve stáji na hluboké podestýlce. Denní krmná dávka sledovaných volků se skládala z lučního sena (ad libitum), kukuřičné siláže (5 kg/kus/den) a jadrného krmiva (3 kg/kus/den). Scale testem byl hodnocen temperament zvířat na základě jejich chování po dobu 30 sekund během vážení. Pro toto hodnocení byla využita pětibodová stupnice (1–5, v rozmezí: klidný – divoký). Flight Speed testem byl hodnocen čas, s přesností na desetinu sekundy (s.), za který zvíře po opuštění váhy překonalo vzdálenost 1,7 m. Celkem byly výše uvedené testy temperamentu třikrát opakovány, přičemž první, druhé a třetí testování bylo prováděno u CH a u MŠS v jejich průměrném věku 446 a 487 dnů, 553 a 594 dnů a 713 a 754 dnů. Z hodnocení temperamentu dle Scale testu především vyplývá, že volci MŠS mají klidnější a poměrně stabilní temperament v závislosti na věku (1,3–1,4–1,4) oproti volkům plemene CH (1,6–1,5–2,5), přičemž nejvyšší rozdíly mezi jednotlivými plemeny v jejich chování během vážení byly zjištěny v rámci posledního opakování (1,4 vs. 2,5). Z hodnocení temperamentu zvířat s využitím Flight Speed testu především vyplývá, že z pohledu jednotlivých plemen byly výsledky tohoto testu v závislosti na věku zvířat, respektive v závislosti na jejich hmotnosti poměrně vysoce vyrovnané, když u CH se výsledky tohoto testu pohybovaly v rozmezí 2,46 s až 2,89 s a u MŠS v rozmezí od 4,09 do 5,33 s. Na druhou stranu je však nutno konstatovat, že v rámci všech opakování byly u volků plemene CH oproti volkům plemene MŠS zjištěny výrazně kratší časy pro překonání vzdálenosti 1,7 m po opuštění váhy. Na úplný závěr je možno konstatovat, že opakované využívání Scale testu a Flight Speed testu vede ke spolehlivějšímu hodnocení temperamentu, a to především u méně početnějších populací zvířat.

temperament, Scale Test, Flight Speed test, volci

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