

Portuguese Sorraia horse dynamics study with innovative technology: Stance and Swing of the Walk

R.A.S. Faria¹, J.A.II.V. Silva², L.Y. Rodrigues², G. Alberto², J.S. Lopes², C. Zucatelle², A.P.A. Vicente^{3,4}

¹Hi-Tech Equine, Marvão, Portugal, ²UNESP, FMVZ Botucatu, São Paulo, Brazil, ³Escola Superior Agrária do IP Santarém, Portugal, ⁴CIISA - FMV, Universidade de Lisboa, Portugal. E-mail: fariasky@gmail.com



1. Introduction

Sorraia horse is an endangered native primitive breed from Portugal, highly inbred with a small census of around 300 animals worldwide. Sorraia horses are considered ponies (1.46m mean height at withers).

The aim of the study was to present the difference between stance (St) and swing (Sw), when the limbs are moving on the ground or in the air, respectively, during stride duration.

2. Material and methods

Walk (W) natural gait, according to the Fédération Équestre Internationale (FEI) :

“... is a marching pace in a regular and well-marked four (4) times beat with equal intervals between each beat.”;

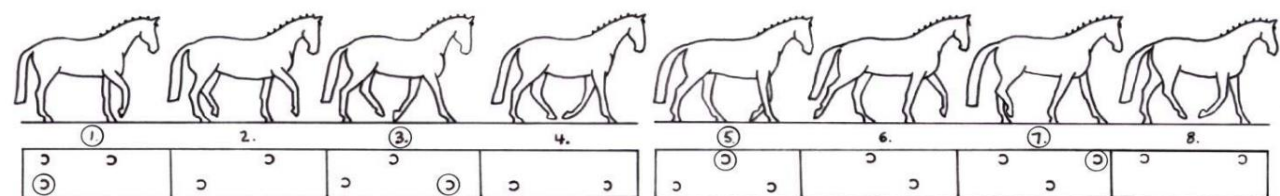


Figure 1. The walk is a pace in four (4)-beat rhythm with eight (8) phases (numbers in circles indicate the beat).

Results were obtained for the total, forelimbs and hindlimbs, left and right sides, and each limb separately using an objective innovative technology (EquiMoves.NL).

Six Sorraia stallions were studied for the variables St and Sw (complete stride duration) at medium Walk.

Stance (St)



Figure 2. The Hindlimbs in Stance.



Figure 3. The Forelimbs in Stance.

Swing (Sw)



Figure 4. The Hindlimbs in Swing.



Figure 5. The Forelimbs in Swing.

Using innovative technology (EquiMoves.NL).



A



B

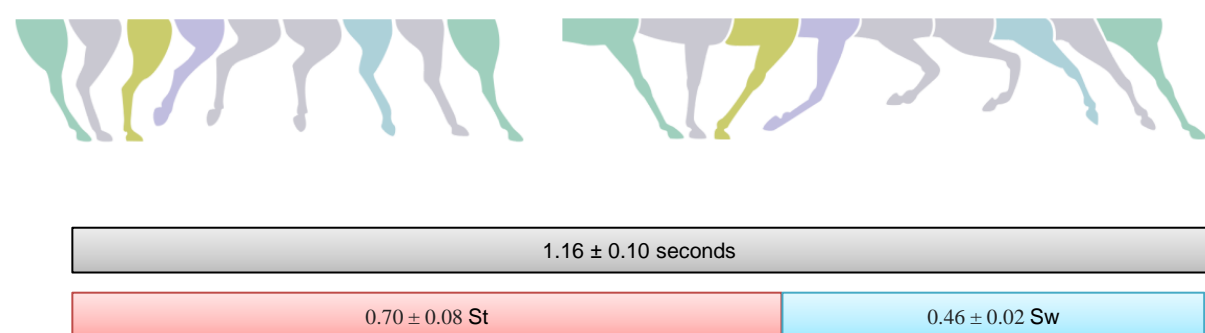


C

Differences in LS means between St and Sw within each variable were significant (p-value < 0.05).

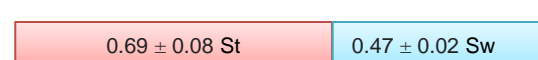
3. Results

The averages of the variables for a complete stride duration (1.16 ± 0.10 s) were 0.70 ± 0.08 s (St) and 0.46 ± 0.02 s (Sw)



were 0.70 ± 0.08 s (St) and 0.46 ± 0.02 (Sw), for the forelimbs, 0.72 ± 0.09 s (St) and 0.44 ± 0.03 (Sw), for hindlimbs 0.69 ± 0.08 s (St) and 0.47 ± 0.02 (Sw).

Hindlimbs



Forelimbs



Minor differences were obtained for the left side of 0.71 ± 0.09 s (St) and 0.45 ± 0.03 (Sw), and for the right side 0.70 ± 0.07 s (St) and 0.46 ± 0.02 (Sw).

The distribution by four limbs (Table 1), was similar among forelimbs and similar among hindlimbs, with hindlimbs 0.03 longer in swing.

Table 1. The distribution of the Stance and Swing by four limbs

Left Forelimb in stance		0,71	0,72		Right Forelimb in stance
Left Forelimb in swing		0,45	0,44		Right Forelimb in swing
Left Hindlimb stance		0,69	0,68		Right Hindlimb stance
Left Hindlimb swing		0,47	0,48		Right Hindlimb swing

Differences between variables St and Sw were significant (P<0.05), indicating that, on average, stride duration of Sorraias stallions is distributed by 60.6% with the limbs on the ground (St) and 39.4 % with the limbs in the air (Sw).



Figure 6. Sorraia horse to walk.



Figure 7. Sorraia horse to walk.

On the other hand, the differences within the variables were not significant (P>0.05) for the forelimbs, hindlimbs, both sides and isolated limbs.

The analysis of the medium Walk for variables St and Sw from Sorraia stallions, indicated that, for a complete stride duration, limbs spend more time on the ground and present identical distribution among all limbs.



Figure 8. Sorraia horses in the pasture.

4. Final Considerations

Sorraia horses are animals with a balanced and symmetrical distribution of the Walk. New studies, including trot and canter, will allow to better understand the distribution of the variables St and Sw for Sorraia horse dynamics and possible differences for the Walk.

Figures 1 of the walk are taken from the dressage regulations of the Fédération Équestre Internationale (FEI).

Figures 2, 3, 4 and 5 are taken from the EquiMoves.NL website.

Figures 6, 7 and 8 were kindly provided by Dr. Antonio Vicente (IPS - ESAS).

A. Hardware EQUIMOVES.nl.

B. Software EQUIMOVES.nl.

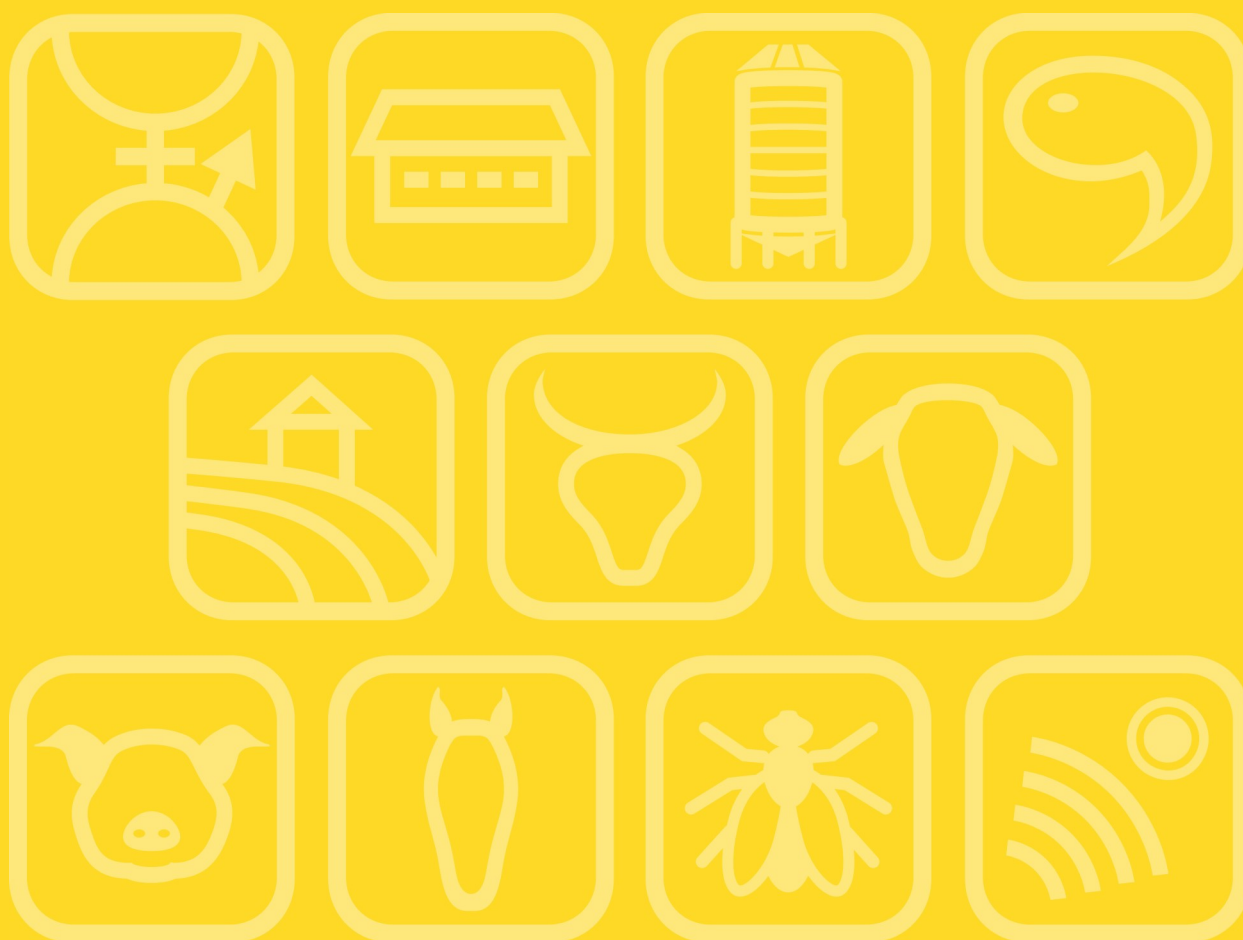
C. Reports EQUIMOVES.nl.



Portuguese Sorraia horse dynamics study with innovative technology: stance and swing of the walk*R.A.S. Faria¹, J.A.I.I.V. Silva², L.Y. Rodrigues², G. Alberto², J. Lopes², C. Zucatelle² and A.P.A. Vicente^{3,4}**¹HT Equine, Escusa, 7330-313 Marvão, Portugal, ²UNESP, FMVZ, Lageado, 18618-681 Botucatu, Brazil, ³ESA do IP Santarém, S. Pedro, 2001-904 Santarém, Portugal, ⁴CIISA – FMV, UL, Lisboa, 1300-477 Lisboa, Portugal; fariasky@gmail.com*

Sorraia horse is an endangered native primitive breed from Portugal, highly inbred with a small census of around 300 animals worldwide. The aim of the study was to present the difference between stance (St) and swing (Sw), when the limbs are moving on the ground or in the air, respectively, during stride duration. Results were obtained for the total, forelimbs and hindlimbs, left and right sides, and each limb separately. Using innovative technology (EquiMoves), six Sorraia stallions were studied for the variables St and Sw (complete stride duration) at medium Walk. The averages of the variables for a complete stride duration (1.16±0.10 s) were 0.70±0.08 s (St) and 0.46±0.02 (Sw), for the forelimbs, 0.72±0.09 s (St) and 0.44±0.03 (Sw), for hindlimbs 0.69±0.08 s (St) and 0.47±0.02 (Sw), for the left side of 0.71±0.09 s (St) and 0.45±0.03 (Sw), and for the right side 0.70±0.07 s (St) and 0.46±0.02 (Sw). The distribution by four limbs was, for left front 0.71±0.09 s (St) and 0.45±0.03 (Sw), right front 0.72±0.08 s (St) and 0.44±0.02 (Sw), left hind 0.69±0.08 s (St) and 0.47±0.02 (Sw) and right hind 0.68±0.06 s (St) and 0.48±0.01 (Sw). Differences between variables St and Sw were significant ($p < 0.05$), indicating that, on average, stride duration of Sorraias stallions is distributed by 60.6% with the limb on the ground (St) and 39.4% with the limb in the air (Sw). On the other hand, the differences within the variables were not significant ($p > 0.05$) for the forelimbs, hindlimbs, both sides and isolated limbs. The analysis of the medium Walk for variables St and Sw from Sorraia stallions, indicated that, for a complete stride duration, limbs spend more time on the ground and present identical distribution among all limbs. Sorraia horses are animals with a balanced and symmetrical distribution of the Walk. New studies, including trot and canter, will allow to better understand the distribution of the variables St and Sw for Sorraia horse dynamics and possible differences for the Walk.

Book of Abstracts of the 73rd Annual Meeting of the European Federation of Animal Science



Book of abstracts No. 28 (2022)

Porto, Portugal

5 – 9 September, 2022

EAN: 9789086863853
e-EAN: 9789086869374
ISBN: 978-90-8686-385-3
e-ISBN: 978-90-8686-937-4
DOI: 10.3920/978-90-8686-937-4

ISSN 1382-6077

First published, 2022

© **Wageningen Academic Publishers**
The Netherlands, 2022



**Wageningen Academic
P u b l i s h e r s**

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned. Nothing from this publication may be translated, reproduced, stored in a computerised system or published in any form or in any manner, including electronic, mechanical, reprographic or photographic, without prior written permission from the publisher:

Wageningen Academic Publishers

P.O. Box 220

6700 AE Wageningen

The Netherlands

www.WageningenAcademic.com

copyright@WageningenAcademic.com

The individual contributions in this publication and any liabilities arising from them remain the responsibility of the authors.

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the European Federation of Animal Science concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The publisher is not responsible for possible damages, which could be a result of content derived from this publication.