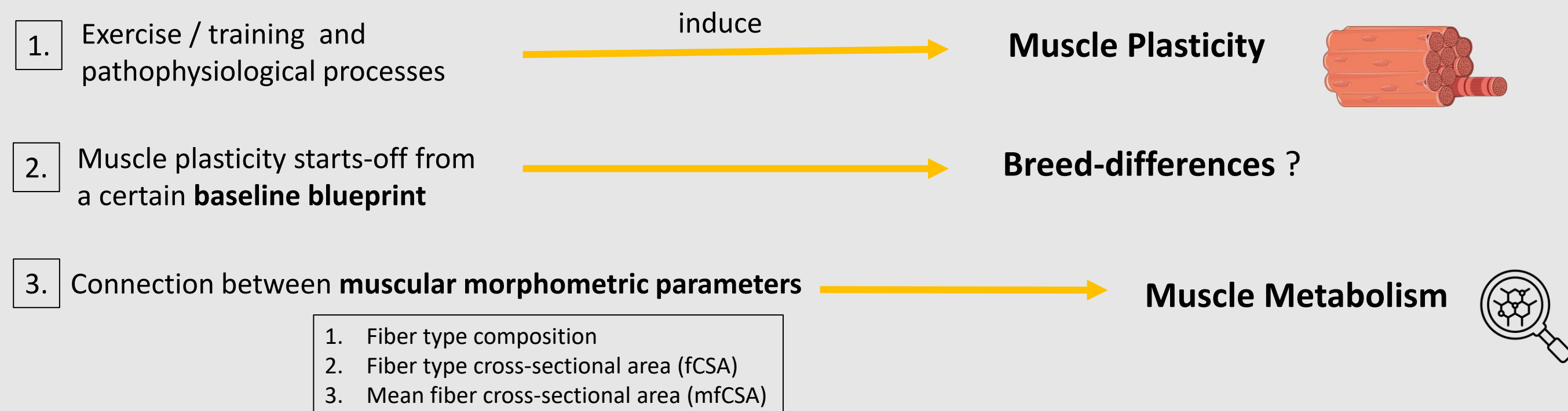


BASELINING PHYSIOLOGICAL PARAMETERS IN POSTURE VERSUS LOCOMOTION MUSCLES ACROSS BREEDS

TOWARDS TAILORED DIETARY AND TRAINING MANAGEMENT

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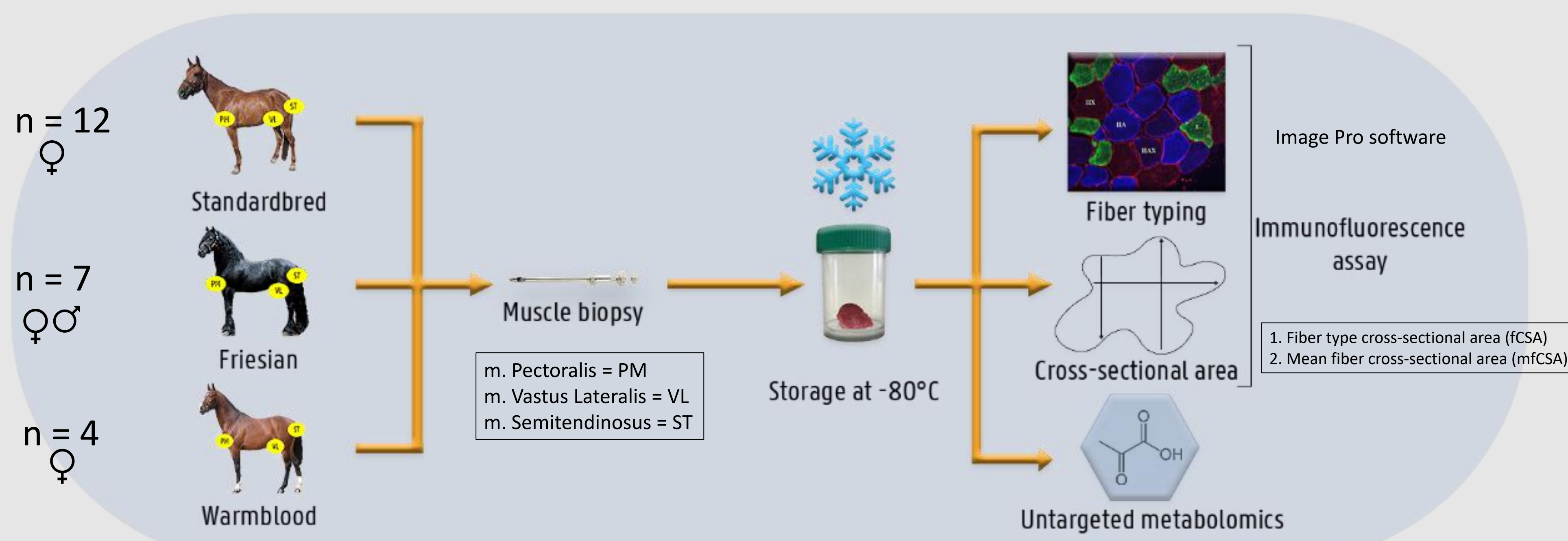
1. Introduction



2. Aim

- To compare **muscle morphometric parameters** and **baseline metabolic blueprint** between **3 archetype horse breeds** in **posture vs locomotion muscles**.
- To find **associations** between muscle morphometric parameters and metabolic blueprints.

3. Methods



Statistical Analyses

- Kruskal-Wallis** for the overall effect of breed on fiber type % and fCSA and mfCSA
- Wilcoxon rank-sum test with Bonferroni correction** for two-by-two comparison of breeds
- Spearman correlation** for the correlation between the breed-metabolites and morphometric muscle parameters

4. Results

Baseline fiber type composition, fCSA, mfCSA and metabolomics in posture versus locomotion muscles in 3 archetypical horse breeds

Friesian (F)	Standardbred (S)	Warmblood (W)
<p>PM of F > S: More type IIx fibers (p = 0.0047)</p>	<p>PM and VL of S > F: More type IIa fibers (p = 0.0003) Significant ↑ mfCSA IIa fibers of VL and PM (p = 0.0017)</p>	<p>No significant differences in Fiber type composition</p>
No significant differences fCSA across breeds		

Metabolomics

<ul style="list-style-type: none"> Long-chain fatty acids Poly-unsaturated fatty acids PM and VL of F > W Short and medium-chain acylcarnitines VL of F > S // F > W PM of F > W Aromatic and branched-chain amino acids PM and VL of F > W Nucleotide pathways VL of F > W // F > S 	<ul style="list-style-type: none"> Xenobiotic pathways VL of S > F Fatty acids Long and very long-chain acylcarnitines VL of S > F Nucleotide pathways VL of S > W 	<ul style="list-style-type: none"> Xenobiotic pathways VL of W > F Fatty acids Long and very long-chain acylcarnitines VL and PM of W > F Carnitine Carbohydrate pathways PM of W > F VL of W > F // W > S
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5. Conclusion

- The first study to combine histomorphological parameters with untargeted metabolomics in posture versus locomotion muscles in three different archetype breeds.
- The ST is least influenced by breed type.
- No significant correlation could be found between muscle morphometric parameters and untargeted metabolomics results.
- Important breed differences in lipid > amino acid > nucleotide and carbohydrate metabolism.
- There are distinct differences in importance of energetic superpathways between breeds.

6. Clinical Relevance

The **specific metabolic blueprint of a certain breed** should be kept in mind when formulating **dietary and training management protocols** to reach full potential in optimal **welfare**.

Standardbred and Warmblood horses are more alike when compared to Friesian horses.

Important **differences in baseline metabolic machinery** should be kept in mind when **extrapolating results of training studies** and studies focusing on **neuro/muscular pathologies**.