



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Federal Department of Economic Affairs,
Education and Research EAER
Agroscope


Using photographs to visualize breeding standards and to calibrate linear description in the Franches-Montagnes horse breed

Ruedi von Niederhäusern, SNSF

International Workshop on Linear Profiling in the Warmblood Horse




www.harasnational.ch

Agroscope Swiss national Stud Farm SNSF



The Franches-Montagnes

- The Franches-Montagnes (FM) is the last native Swiss horse breed with multiple use and good character
- The breed has developed from a heavy draught breed used in agriculture to a light draught breed that excels in leisure riding and in international driving competitions

<https://www.lenouveliste.ch/articles/sports/autres-sports/jerome-voulaz-721679>

International Workshop on Linear Profiling | Ruedi von Niederhäusern, SNSF
2

Agroscope Swiss national Stud Farm SNSF

Linear description and breeding value estimation in the FM breed

- Since 2006, breeding values are estimated for 43 traits using a multi-trait animal model ("BLUP").

Traits (phenotypes)	Judged	Described	Measured	Total
Conformation traits	3	24	1	28
Performance traits (Field test for driving and riding)		12		12
White markings		3		3

International Workshop on Linear Profiling | Ruedi von Niederhäusern, SNSF

3

Linear description sheet

LINEARE BESCHREIBUNG FÜR CH-PFERDE (3jährig und älter) OLD version
DESCRIPTION LINEAIRE POUR CHEVAUX CH (3 ans et plus)

Schau/Concours: _____ Datum/Date: _____ Richter/Juge: _____
 ID-Nr.: _____ Vater/Père: _____
 Geburtsdatum/Date de naissance: _____ m. f. Rasse: FM DS HF MT

Typ/Type _____

Gesamterscheinung/généralité: _____ Körperbau/Conformation: _____ Gänge/Allures: _____ Stockmassicht, au garrot: _____
 Ausdruck/Air: 1 2 3 4 5 6 7 8 9 Ausdruckswillig/expressive: _____ Mangel/Defauts

1. Kopfausdruck/Expression de la tête ausdruckslos ausdrucksvoll/expressive

2. Gesicht/Gesicht face voll flach/léger

3. Halslänge/Long. de l'encolure kurz lang/longue

4. Halsbau/Attache de l'encolure tief hoch/haute

5. Halsmuskulatur/Musculature du cou wenig schwach/maigre

6. Widerristhöhe/Hauteur du garrot flach hoch/haut

7. Widerristlänge/Longueur du garrot kurz lang/long

8. Schulterlänge/Longueur de l'épaule kurz lang/longue

9. Schulterneigung/Incl. de l'épaule steil schräg/inclinée

10. Rückenlänge/Longueur du dos kurz lang/long

11. Rückenlinie/Ligne du dos weich gerade/horizontale

12. Kruppenlänge/Long. de la croupe kurz lang/longue

13. Kruppenneigung/Incl. de la croupe horizontal abfallend/abaissée

14. Behauung/Feine wenig viel/abundant

15. Vorderbein/Jambe antérieure ruckbaugig vorbeugig knieweit/étranglé ant. knieweit/genuum ouvert

16. Sprunggelenkeineinleitung/Angle des jarrets steil geneigt abwärts/abaisse abwärts/inclinaison

17. Fesselneigung/Angle des pastilles steil weich steil Bockfuß/maltraité weiches/talons fuyants

18. Fundament/Fundament schwammig trocken/sec

19. Schritt/Pas kurz raumgreifend bahm vo. B. B.

20. Trab/Trab kurz raumgreifend bahm vo. B. B.

21. Trittschub/Trot engagement wenig viel losgeritten

22. Trittschub/Trot engagement wenig viel losgeritten

23. Kontakt d. Gänge/Contact. des allures elastisch elastisch

24. Typ/Type typus typus überbaut/surbaillé schmal/droit

Bemerkungen/Remarques: _____

Agroscope Swiss national Stud Farm SNSTF

Phenotypes of the FM breed

- Breeding values of the stallions are published annually.

000071947, Nils_du_Sous-Bois, 2007

Weisse Abzeichen		-20	100	+20
Total		95		
Arbe		88	100	
Vorbe		88		
Neben		88		

Feldtest

Blancher	100
Allures	100
F. Schritt	122
F. Trab	111
Fahrtwegung	100
Durchschlag	100
Nachtrieb	114
Bl. Schritt	100
Bl. Trab	107
Bl. Galopp	100
Reitwegung	100
Bl. Ausdr.	100

Lineare Beschreibung

Streckmess	100
Ext. Typ	114
Ext. Körperbau	113
Ext. Gang	119
Stützbein	112
Gelenk	100
Halslänge	113
Halsbreite	116
Halsmuskulatur	100
Widerristhöhe	100
Widerristlänge	121
Schulterlänge	114
Schulterwinkel	116
Brustbreite	100
Krüppellänge	93
Krüppelwinkel	100
Brusttiefe	100
Brustbreite	100
Sprungbein	121
Fußbreite	117
Schweiflänge	119
Stützbein	116
Stütz-T	119
Stütz-E	112
Gangbein	112
Typ	112

Agroscope, Swiss National Stud Farm (SNSTF) and Franches-Montagnes (FM) association, 2015

International Workshop on Linear Profiling | Ruedi von Niederhäusern, SNSF

5

Agroscope Swiss national Stud Farm SNSTF

Tool for breeders

- We calculate mean breeding values between all available stallions and potential broodmares in the virtual foal
- Breeders can get expert advice based on the estimated breeding values
- Important for native breeds: inbreeding coefficient

PV Hydromel 026132992

M Mandoline J.K. 042130006

Degré parenté parents	0.1383	Coeff. cosanguinité du poulain	0.0691
	13.83%		6.91%
Degré parenté mère avec tous les pères	0.1456	Degré parenté père avec toutes les mères	0.1472
	14.56%		14.72%

VE MARQUES BLANCHES	VE TET GLOB
Total 102	Total TET 107 COMP TET 106
Tête 97	
Antérieure 104	VE TET ATTELAGE
Postérieure 104	Total attelage 106
	VE TET EQUITATION
Extérieur	Total Equitation 108
Taille 112	Détail
Total Ext 122	Limón 104
Type 120	Démarrage 107
Conf 122	Pas 110
Allures 124	Trot 102
	Apt Att 108
	Mania 108
	Comportement 106
	Pas 108
	Trot 107
	Galop 106
	Apt Equit 110
	Montoir 108

Agroscope, Swiss National Stud Farm (SNSTF) and Franches-Montagnes (FM) association, 2017

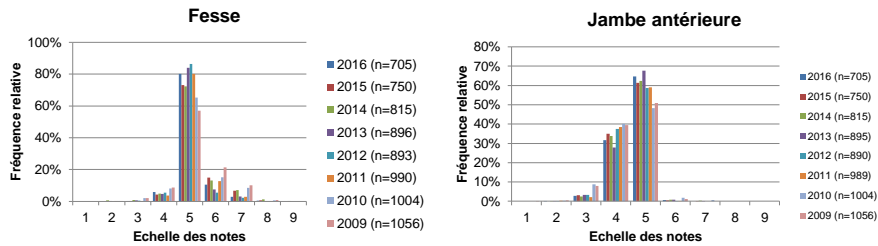
International Workshop on Linear Profiling | Ruedi von Niederhäusern, SNSF

6

III.1 (R. von Niederhäusern)

3

Problems...



- Distribution around the perceived optimal value
- But where is the optimum?

Linear trait	Mean	Mode	Range
21. Trot: Engagement	9.00	9.00	9
22. Trot : Elasticity	9.00	9.00	9
23. Correctness of gaits	5.00	5.00	5
24. Type	8.50	9.00	5-9

Pfammatter, 2017

International Workshop on Linear Profiling | Ruedi von Niederhäusern, SNSF

7

The ideal is changing over time

- Native breeds depend more on type than on performance measures, unlike most Warmblood breeds
- Historically, development from a heavier draught breed to a leisure/sports horse
- The type preference is changing, but there is no real measure or limit for development
 - Height at withers fixed at 150 to 160 cm
- How do we «calibrate» our judges?



1999: Type 9



2014: Winner FT, Type 8

🇨🇭 Bachelor Thesis Marie Pfammatter

- Development of a scale on photographs of all scales we can see (15/24)
- One basic photograph is modified according to expert opinions (3 experts)
- The photographs are graded by the judges of the breed
 - Agreement of the intended grade (experts) vs judges
 - Agreement of judges among themselves
- Improve the existing list of assessed criteria
 - Important/unimportant



Neck muscling, grade 1



Neck muscling, grade 9

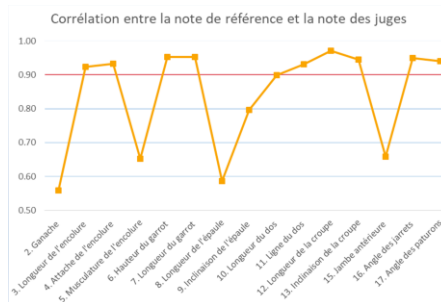
International Workshop on Linear Profiling | Ruedi von Niederhäusern, SNSF

Pfammatter, 2017

9

🇨🇭 Correlations between photos and judges

- Correlation between the anticipated grade and the grade the judges gave
- Lowest correlation for
 - Jaw line,
 - Neck muscling,
 - Shoulder length,
 - Forelimb



Pfammatter, 2017

International Workshop on Linear Profiling | Ruedi von Niederhäusern, SNSF

10

Agroscope Swiss national Stud Farm SNSF

Judges grading the photographs

- Sometimes there is very little agreement which photograph represents what extreme

- Sometimes, there is at least a ranking agreement even if there are some differences in the grade itself

Critère 2: Ganaches

Critère 7: Longueur du garrot

International Workshop on Linear Profiling | Ruedi von Niederhäusern, SNSF
Pfammatter, 2017
11

Agroscope Swiss national Stud Farm SNSF

Importance of individual criteria (15/24)

- Important for the judges
 - Type,
 - Correctness of gaits,
 - forelimb,
 - line of back,

- Less important for the judges
 - Hock angle
 - Hind quarters muscling
 - Attachment of the neck

- Traits important for some, unimportant for others
 - Head expression
 - Overall quality of the legs

L'importance des critères de la DL selon les juges

Nombre de fois mentionné par les juges

Pfammatter, 2017

International Workshop on Linear Profiling | Ruedi von Niederhäusern, SNSF
12

New ideas for implementation

LINEARE BESCHREIBUNG FÜR CH-PFERDE (jährig und älter)
DESCRIPTION LINEAIRE POUR CHEVAUX FM (3 ans et plus)

OLD VERSION

Schulz/Contour: _____ Datum/Date: _____ Rufname/Jug: _____

ID No.: _____ Value/Val: _____

Geburtsdatum/Date de naissance: _____ m. f. Rasse: FM DS HF MT

DESCRIPTION LINEAIRE POUR CHEVAUX FM
LINEARE BESCHREIBUNG FÜR FM - PFERDE

Barcode Etiquette

N° ident.

Signature du juge/Unterschrift des Richter: _____

N°/ID: _____ Pèce / Valeur: _____ Date / Datum: _____

Nom / Name: _____ m. f. FM: DS: HF: MT:

Type/Typ		Körperbau/Conformation		Gänge/Allures		Stockmaß/H. au garrot:							
		1 2 3 4 5 6 7 8 9		extrem		Mängel/Défauts							
1. Kopfansicht	extrem	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ausdruckslos	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ausdruckslos	<input type="checkbox"/>	<input type="checkbox"/>
— Expression de la tête		sans expression				expressive							
2. Ganzheit	voll	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	flau	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	flau	<input type="checkbox"/>	<input type="checkbox"/>
— Ganache		pleine				fine							
3. Halslänge	kurz	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	lang	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	lang	<input type="checkbox"/>	<input type="checkbox"/>
— Long. de l'encolure		court				longue							
4. Halsumfang	stief	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	hoch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	hoch	<input type="checkbox"/>	<input type="checkbox"/>
— Circ. de l'encolure		basse				haute							
5. Halsmuskulatur	wenig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	schwach	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	schwach	<input type="checkbox"/>	<input type="checkbox"/>
— Musculature de l'enc.		peu				moyenne							
6. Widerristhöhe	fach	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	hoch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	hoch	<input type="checkbox"/>	<input type="checkbox"/>
— Hauteur de garrot		court				haut							
7. Widerristlänge	kurz	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	lang	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	lang	<input type="checkbox"/>	<input type="checkbox"/>
— Longueur de garrot		court				long							
8. Schulterlänge	kurz	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	lang	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	lang	<input type="checkbox"/>	<input type="checkbox"/>
— Longueur de l'épaule		court				longue							
9. Schulterumfang	stiel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	schlaff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	schlaff	<input type="checkbox"/>	<input type="checkbox"/>
— Circonf. de l'épaule		sec				molle							
10. Rückenlänge	kurz	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	lang	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	lang	<input type="checkbox"/>	<input type="checkbox"/>
— Longueur de dos		court				long							
11. Rückenbreite	weich	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	gerade	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	gerade	<input type="checkbox"/>	<input type="checkbox"/>
— Largeur de dos		mou				horizontale							
12. Krüppelung	kurz	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	lang	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	lang	<input type="checkbox"/>	<input type="checkbox"/>
— Long. de la croupe		court				longue							
13. Krüppelung	horizontal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	abwärts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	abwärts	<input type="checkbox"/>	<input type="checkbox"/>
— Incl. de la croupe		horizontale				oblique							
14. Behauung	wenig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	viel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	viel	<input type="checkbox"/>	<input type="checkbox"/>
— Poils		peu				forme, subtile							
15. Vorderbein	rückbeig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	vorneig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	vorneig	<input type="checkbox"/>	<input type="checkbox"/>
— Memb. antérieurs		arriérés				avancés							
16. Sprunggelenkneigung	stiel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	gewinkelt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	gewinkelt	<input type="checkbox"/>	<input type="checkbox"/>
— Angle des jarrets		sec				courbé							
						<input type="checkbox"/> eingesenkt, vor. <input type="checkbox"/> hinten							
						<input type="checkbox"/> straight ant. <input type="checkbox"/> post.							
17. Fesselwinkel	stiel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	weich	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	weich	<input type="checkbox"/>	<input type="checkbox"/>
— Angle des rotules		sec				mou							
18. Fundament	schweremig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	leicht	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	leicht	<input type="checkbox"/>	<input type="checkbox"/>
— Fondement		souple				souple							
19. Schritt	kurz	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	reingehend	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	reingehend	<input type="checkbox"/>	<input type="checkbox"/>
— Pas		court				serré							
20. Trab	kurz	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	reingehend	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	reingehend	<input type="checkbox"/>	<input type="checkbox"/>
— Trot		court				serré							
21. Trab-Schub	wenig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	viel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	viel	<input type="checkbox"/>	<input type="checkbox"/>
— Trait engagé		peu				beaucoup							
22. Trab-Einstellung	stiel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	elastisch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	elastisch	<input type="checkbox"/>	<input type="checkbox"/>
— Trait élastique		sec				élastique							
23. Korsett des Allures	lockhart	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	billig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	billig	<input type="checkbox"/>	<input type="checkbox"/>
— Corset des allures		raide				lâche							
24. Typ	typisch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	typisch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	typisch	<input type="checkbox"/>	<input type="checkbox"/>
— Type		typique				atypique							
25. Typ	extrem	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	extrem	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	extrem	<input type="checkbox"/>	<input type="checkbox"/>
— Type		extrême				normal							

Bemerkungen/Remarques: _____

Practical examples

Source: <http://pngimg.com>

International Workshop on Linear Profiling | Ruedi von Niederhäusern, SNSF

 **Thank you for your attention**



Agroscope Swiss national Stud Farm

Agroscope Swiss national Stud Farm SNSF

International Workshop on Linear Profiling | Ruedi von Niederhäusern, SNSF

15