Progressive weaning reduces negative behavioral and biological effects in horses

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IMPACT of WEANING on WELFARE

Strong links between foals and mares at birth

Under feral conditions:

• Weaning appears after ~10 months

• Foals stay close to their mother until 2 years of age

Under rearing conditions:

• Weaning appears between 4 and 6 months

• Weaning is sudden and decided by humans

Stress, welfare alterations
Loss of weight
↑ vulnerability to diseases
Appearance of stereotypies
Experimental Design

**Progressive group**
Mare-foal dyads daily separated by a fencing panel before weaning

**Sudden group**
Mare-foal dyads in permanent contact before weaning

Four weeks preceding weaning

Beh: Behavioural observations
Pers: Personality tests
Cort: Salivary cortisol
CRP: Plasma C reactive protein
Genes: Microarray Gene Expression Studies
Telo: Telomere length
RESULTS: Behavioral stress responses on day of weaning

Twice less neighs

Three times less trots
RESULTS: Effects on foal personality

Less fearful of humans
Less gregarious
Less active
Less fearful of new object
More curious
RESULTS: Biological stress response

CORTISOL

Less cortisol one day after weaning no longer significant 30 days later

C REACTIVE PROTEIN

No effect of weaning method
No reliable results for IL-1, IL-6 and TNFa

Telomere length

No effect of weaning method
Non significant decrease with age
RESULTS: Effects on gene expression (blood cells)

Sparse Least Square-Discriminant Analysis (SpLS-DA):
genases that contribute the most to discriminate experimental groups

22 discriminating genes on X-variate 2
Z score 22 genes = composite z score of the 22 genes’s z score expression data

\[ z\text{-score} = \frac{x - \mu}{\sigma} \]

x = gene expression value
CONCLUSION:

➢ Progressive weaning induced inquisitive, less fearful and less gregarious personalities at least in mid-term

➢ PCA analysis highlighted relationships between biomarkers and behavior/personality traits and revealed a healthier profile for Prog vs Sudd foals

➢ Progressive weaning was also found beneficial for mares (data not shown)

This work is now published:

Lansade L, Foury A et al, 2018, Psychoneuroendocrinology 97: 59-68
Acknowledgements

Nutrineuro, INRA, Bordeaux
A Foury
MP Moisan

Physiology, Reproduction and Behavior
INRA, Nouzilly,
M Vidament
G Bouvet
D Soutet
C Parias
A Ruet
F Levy
L Lansade

Experimental Unit, INRA, Nouzilly
F Reigner
E Guettier

Genotoul GeT-TriX facility, Toulouse
Y Lippi
C Naylies
Experimental Design

Progressive weaning: 18 foals and 18 mares  n=9 dyads foal-mare

7 months

28 daily separations during 4 weeks

15 min

8 months

Definitive weaning

6 h
Experimental Design

Sudden weaning: 16 foals and 16 dams  n=8 dyads foal-dam

8 months

No preparation

Definitive weaning