# Impact of unrelated adults on the behaviour of weanlings & young horses

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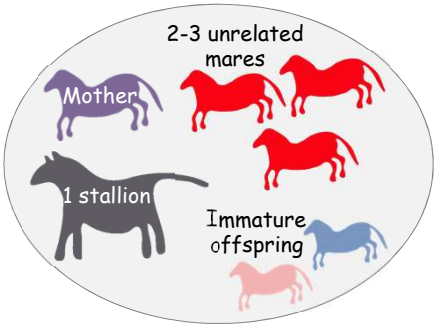
UMR CNRS 6552 Ethologie Animale et Humaine

## GENERAL INTRODUCTION

### NATURAL CONDITIONS




A high variety of social partners

(*e.g.* Feh 2005, Waring 2003)

The young horse is « modeled » by these diverse social influences




(*e.g.* Bourjade 2007, in prep., Waring 2003)

## GENERAL INTRODUCTION

**DOMESTIC CONDITIONS**

From birth to weaning : the dam (+ others mares & same-age peers)

From weaning to training (2-3 yrs)

**Social isolation**

**Abnormal behaviours**

(*e.g.* Waters et al. 2002, Nicol 1999, Heleski et al. 2003)

**Aggressiveness**

(*e.g.* Christensen et al. 2002, Søndergaard & Ladewig 2004)

**Same-sex & same-age groups**

**No adult partners**

**What impact on the behaviour of young horses ?**

At weaning ?

At the ages of 1 & 2 years ?

## Part I – Impact of the presence of unrelated adults on the behaviour of weanlings

Henry et al., subm.

**WEANING**

**NATURAL CONDITIONS**

- Progressive process
- 9/10 months of age
- « Food » weaning by the mare
- Foal remains in its natal group

**DOMESTIC CONDITIONS**

- Abrupt separation from the dam
- 4-7 months of age
- « Food + Social » weaning
- Under human control

| | |
|---|---|
| Short-term effects | **Whinnies ↑, Locomotion ↑** (Houpt et al. 1984, McCall et al. 1985)<br>**Aggressiveness ↑** (Hoffman et al. 1995)<br>**HR & Cortisol ↑** (McCall et al. 1987, Malinowski et al. 1990)<br>**Weight loss** (Waran et al. 2008)<br>**+ High risk of injuries** (Waran et al. 2008) |
| Long-term effects | **Emergence of abnormal behaviours** (Waters et al. 2002) |

## Part I – Impact of the presence of unrelated adults on the behaviour of weanlings

Henry et al., subm.

***Several factors may influence weaning stress reactions***

**Housing conditions**

(Heleski et al. 2002, Waters et al. 2002)

**Feeding conditions**

(Holland et al. 1996, Nicol et al. 2005)

**Social conditions**

→ **The highest reactions are observed for foals weaned singly in a box**

→ **Less vocalizations in Pair-weaned & Group-weaned foals / Isolated foals**
(McCall et al. 1985, 1987, Heleski et al. 2002, Waters et al. 2002)
**… but many inter-foal aggressions & higher risk of injuries** (Holland et al 1995)

→ **Foals living in groups of mare-foal pairs react less to the progressive retrieval of mares** than to the abrupt retrieval of all mares *(Holland et al. 1996, Wulf et al. 2008)*

**May the introduction of unrelated adults help foals to recover from weaning?**

## Part I – Impact of the presence of unrelated adults on the behaviour of weanlings

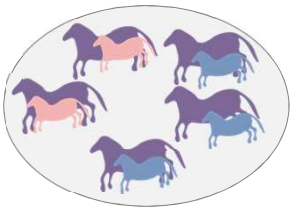
Henry et al., subm.

An experimental study

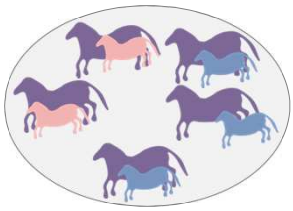
33 foals (13 colts, 20 fillies)
2 farms: • farm 1 (USA) → weaning at 4.5 months of age; Ar
• farm 2 (Fr) → weaning at 7 months of age; SF, AA

**Treatment groups**

**Peer-weaned group** (PW)



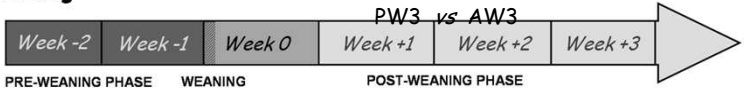
**Adult-weaned groups** (AW)



x 3
PW1 *vs* AW1
PW2 *vs* AW2
PW3 *vs* AW3

Introduction of 2 socially experienced adults
(11-21 years, gelding/mares)

**Data recording**



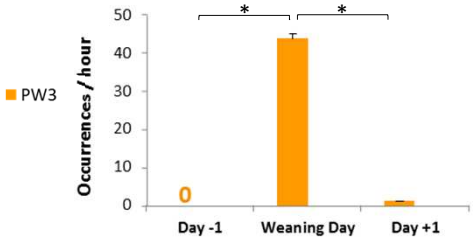
## Part I – Impact of the presence of unrelated adults on the behaviour of weanlings

Henry et al., subm.

### What about WEANING STRESS REACTIONS ?

**Peer-weaned group** (PW)

Increased rates of vocalizations during the weaning day




Wilcoxon: * $p < .05$

## Part I – Impact of the presence of unrelated adults on the behaviour of weanlings

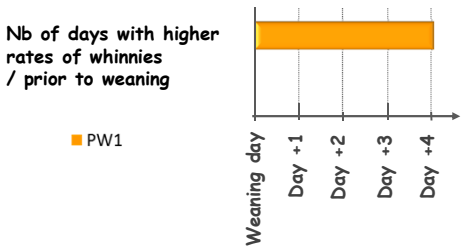
Henry et al., subm.

### What about WEANING STRESS REACTIONS ?

**Peer-weaned group** (PW)

Increased rates of vocalizations during the weaning day

Expression of whinnies for long periods of time in the younger weanlings



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Henry et al., subm.

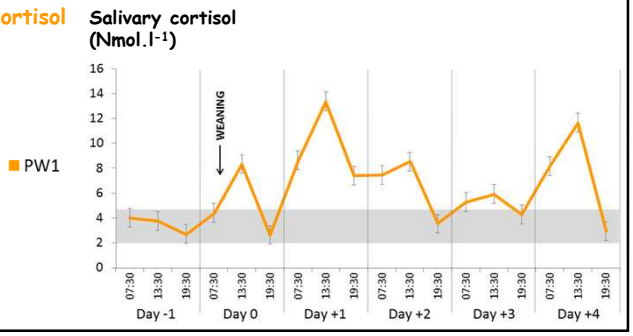
### What about WEANING STRESS REACTIONS ?

**Peer-weaned group** (PW)

Increased rates of vocalizations during the weaning day

Expression of whinnies for long periods of time in the youngest weanlings

An increase of salivary cortisol release

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Henry et al., subm.

### What about WEANING STRESS REACTIONS ?

**Peer-weaned group** (PW)

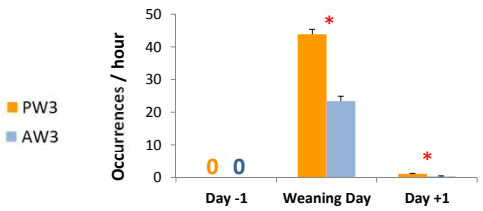
Increased rates of vocalizations during the weaning day

Expression of whinnies for long periods of time in the youngest weanlings

An increase of salivary cortisol release

**Adult-weaned groups** (AW)

Lower rates of vocalizations at weaning / PW




MW: * p < .05

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Henry et al., subm.

### What about WEANING STRESS REACTIONS ?

**Peer-weaned group (PW)**

Increased rates of vocalizations during the weaning day

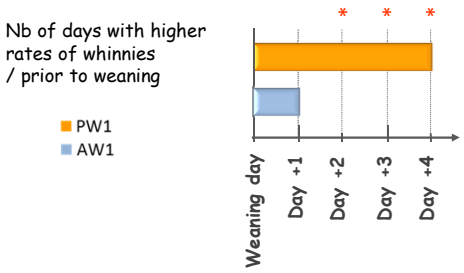
**Expression of whinnies for long periods of time in the youngest weanlings**

An increase of salivary cortisol release

**Adult-weaned groups (AW)**

Lower rates of vocalizations at weaning / PW

**Expression of whinnies for shorter periods of time** / PW




Fisher: * p < .05

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Henry et al., subm.

### What about WEANING STRESS REACTIONS ?

**Peer-weaned group (PW)**

Increased rates of vocalizations during the weaning day

Expression of whinnies for long periods of time in the youngest weanlings

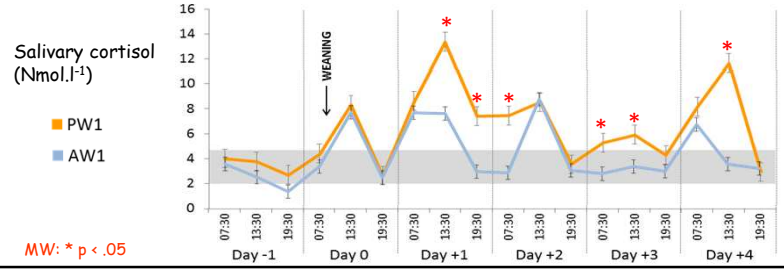
**An increase of salivary cortisol release**

**Adult-weaned groups (AW)**

Lower rates of vocalizations at weaning / PW

Expression of whinnies for shorter periods of time / PW

**Lower levels of salivary cortisol from the day following weaning** / PW




MW: * p < .05

## Part I – Impact of the presence of unrelated adults on the behaviour of weanlings

Henry et al., subm.

### What about LONGER-TERM EFFECTS ?

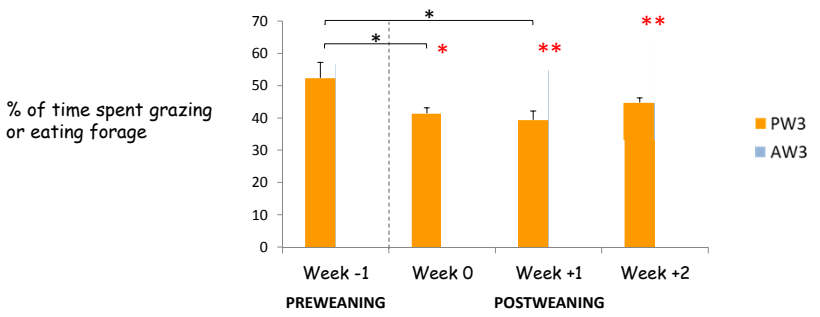
**Peer-weaned group** (PW)

A decrease in time spent in feeding activities

**Adult-weaned groups** (AW)

No decrease of feeding activities

*Example :*




MW: * p < .05, ** p < .01

## Part I – Impact of the presence of unrelated adults on the behaviour of weanlings

Henry et al., subm.

### What about LONGER-TERM EFFECTS ?

**Peer-weaned group** (PW)

A decrease in time spent in feeding activities

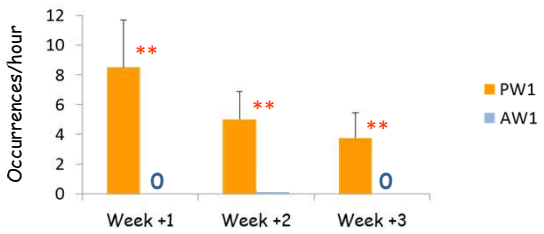
Emergence of redirected sucklings (towards peers)

**Adult-weaned groups** (AW)

No decrease of feeding activities

Little emergence of redirected sucklings (n=1)

*Example :*




MW: * p < .05, ** p < .01

## Part I – Impact of the presence of unrelated adults on the behaviour of weanlings

Henry et al., subm.

### What about LONGER-TERM EFFECTS ?

**Peer-weaned group** (PW)

A decrease in time spent in feeding activities

Emergence of redirected sucklings (towards peers)

**Emergence of abnormal behaviours** (wood-chewing)

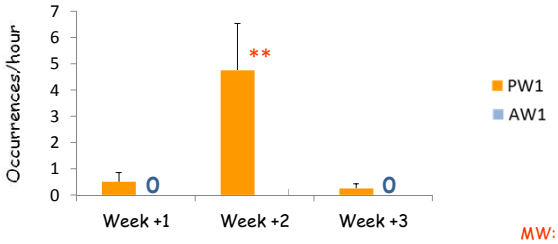
**Adult-weaned groups** (AW)

No decrease of feeding activities

No emergence of redirected sucklings

**Little emergence of abnormal behaviours (n=1)**

*Example :*




MW: * p < .05, ** p < .01

## Part I – Impact of the presence of unrelated adults on the behaviour of weanlings

Henry et al., subm.

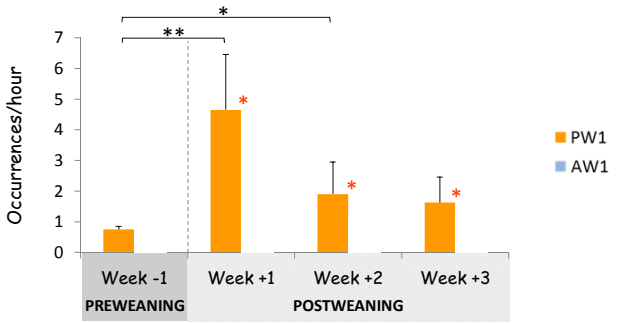
### What about SOCIAL INTERACTIONS ?

**Peer-weaned group** (PW)

**An increase of inter-foal aggressions**

**Adult-weaned groups** (AW)

**Few inter-foal aggressions** / PW




Wilcoxon: * p < .05, ** p < .01

MW: * p < .05

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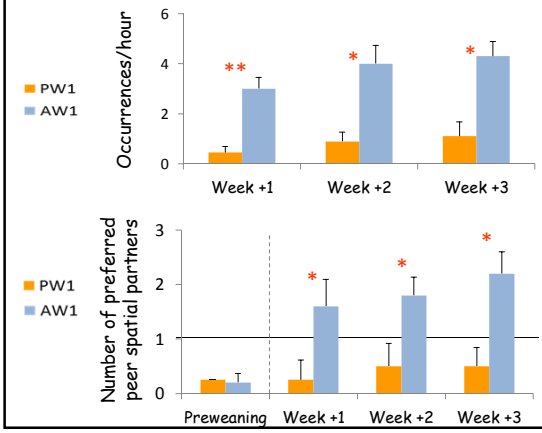
### What about SOCIAL INTERACTIONS ?

**Peer-weaned group** (PW)

An increase of inter-foal aggressions




**Adult-weaned groups** (AW)

Few inter-foal aggressions / PW

+

Many positive interactions between foals / PW

Emergence of social preferences / PW

MW: * p < .05, ** p < .01

## Part I – Impact of the presence of unrelated adults on the behaviour of weanlings

Henry et al., subm.

### CONCLUSION

**WEANING IN GROUPS OF PEERS IS STILL A HIGHLY STRESSFUL EVENT**

- ↑ whinnies, ↑ cortisol,
- ↑ inter-foal aggressions
- Emergence of frustrated behaviours and abnormal behaviours

**A SIMPLE SOLUTION : The introduction of socially experienced adults**

- ↓ weaning stress reactions
- ↓ undesirable behaviours associated with artificial weaning: redirected suckling, aggressions and abnormal behaviours

- **A positive effect on social behaviours**

**May the presence of unrelated adults improve social skills of young horses ?**

## Part II – Impact of the presence of unrelated adults on social skills in 1- and 2-year-old horses

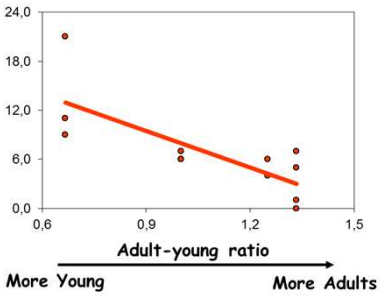
Bourjade et al., 2008

**May the presence of unrelated adults improve social skills of young horses ?**

The Przewalski horse fieldwork

Bourjade et al. (2009) PLoS One 4 (3)

Number of aggressive interactions between young horses




→ The occurrence of aggression towards peers in 1- and 2-year old horses is negatively correlated with the adult-young ratio.

→ **WHEN ADULTS ARE IN FEWER PROPORTION, THE YOUNG HORSES SHOW MORE AGGRESSIVNESS TOWARDS PEERS**

## Part II – Impact of the presence of unrelated adults on social skills in 1- and 2-year-old horses

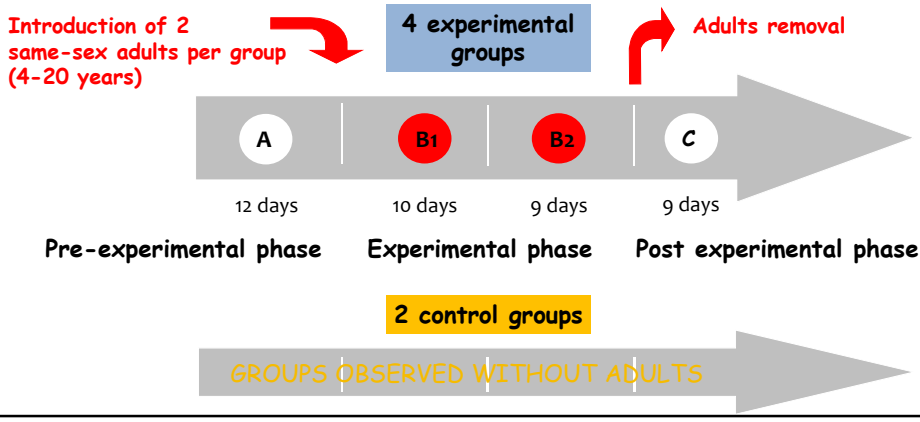
Bourjade et al., 2008

An experimental study

Same-age / Same-sex Groups

52 yearlings and 2-year-old horses

6 groups / 2 ha pasture each



## Part II – Impact of the presence of unrelated adults on social skills in 1- and 2-year-old horses

Bourjade et al., 2008

**Domestic conditions:**
**→ same-sex & same-age groups of young horses**

- A typical time-budget (grazing → 76%, resting → 16%, locomotion → 4%)

**BUT…**

**High frequencies of play** (6.62/h)

**High frequencies of agonistic interactions** (3.86/h)

**Low frequencies of affiliative interactions** (0.44/h)

**Less than 1 preferential spatial partner**

**A reduced behavioural repertoire**

Bourjade et al. (2008) Dev psychobiol 50: 408-417

## Part II – Impact of the presence of unrelated adults on social skills in 1- and 2-year-old horses

Bourjade et al., 2008

**Changes in behaviours after the introduction of adults**

**WITHOUT ADULTS**

**WITH ADULTS**

**Grazing, Locomotion, Standing resting, Grooming, Exploration, Aggression, Play**

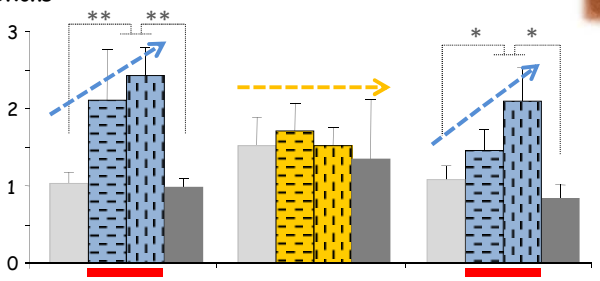
**Resting recumbent, Mutual grooming, Snapping at adults, Flehmen, Sexual behaviours** (mount), **Adult-like encounter behavioural patterns** (head bowing, fecal pile display in males)

## Part II – Impact of the presence of unrelated adults on social skills in 1- and 2-year-old horses

Bourjade et al., 2008

### Changes in social interactions

Hourly frequency of positive interactions




Presence of 2 adults

1 year-old experimentals | Controls | 2 year-old experimentals

Wilcoxon:
* p < .05, ** p < .01

Increase of positive social interactions during the presence of adults

No lasting effects

## Part II – Impact of the presence of unrelated adults on social skills in 1- and 2-year-old horses

Bourjade et al., 2008

### CONCLUSION

YOUNG HORSES RAISED IN SAME-AGE & SAME-SEX GROUPS DON'T EXHIBIT SOME SPECIES BEHAVIOURS AND ARE AGGRESSIVE

A SIMPLE SOLUTION : The introduction of socially experienced adults

A POSITIVE IMPACT ON BEHAVIOURAL DEVELOPMENT
AND IN PARTICULAR SOCIAL DEVELOPMENT

## GENERAL DISCUSSION

**IN HORSES, UNRELATED ADULTS REGULATE STRESS REACTIONS, AGGRESSION RATES & SOCIAL RELATIONSHIPS**

*As in other group living species :*

- **Important social models** *(e.g. Seyfarth & Cheney 1986 )*
- **Regulation role played by adults** (e.g. West et al. 1997, Slotow et al. 2000)
- **Deleterious effects of the absence of adults** *(e.g. Slotow et al. 2000, Cousillas et al. 2006)*

**Importance of keeping young horses with unrelated adults**

**Importance of choosing appropriate adult models: "socially experienced & calm"**

**BUT…**

**Characteristics of adults (familiarity, age, sex) ?**

**Adult-young ratio ?**

(Burchinal et al. 2000; Bertin et al. 2007, 2008)

## Thank you for your attention !

**Many thanks to:**

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