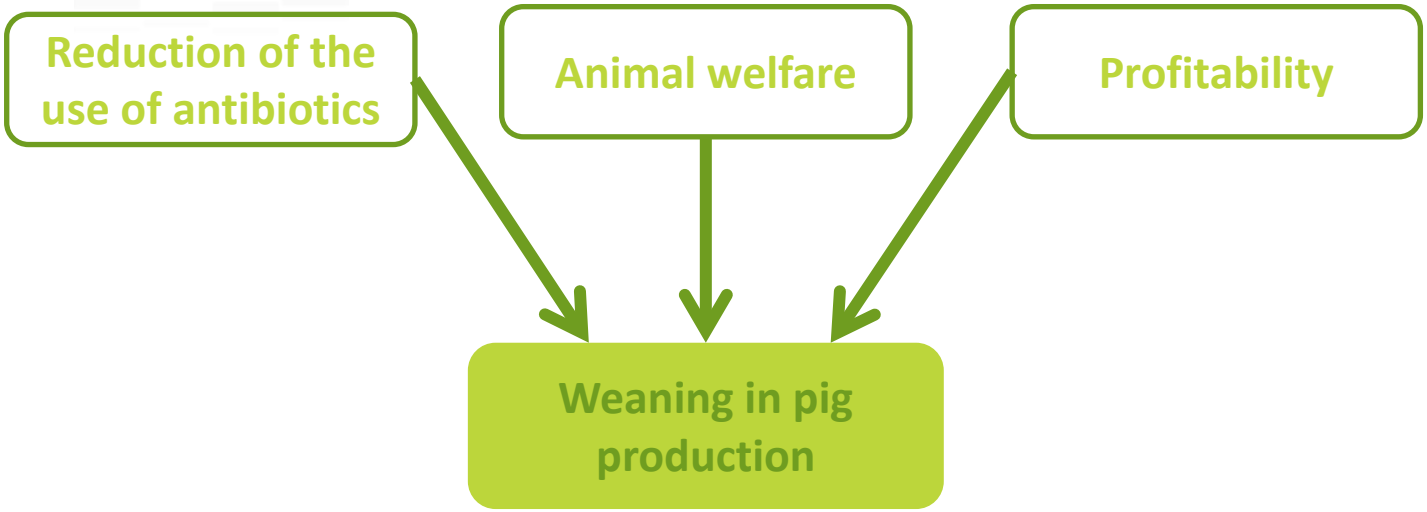
EFFECTS OF WEANING CONDITIONS ON METABOLIC PARAMETERS, GROWTH AND HEALTH OF PIGLETS

Arnaud BUCHET[abc], Catherine BELLOC[c], N. LE FLOC'H[a], Elodie MERLOT[a]

[a] UMR PEGASE, Agrocampus Ouest, INRA, 35590 Saint-Gilles, France
[b] Cooperl Arc Atlantique, 22403 Lamballe, France
[c] BIOEPAR, INRA, ONIRIS, 44307 Nantes, France

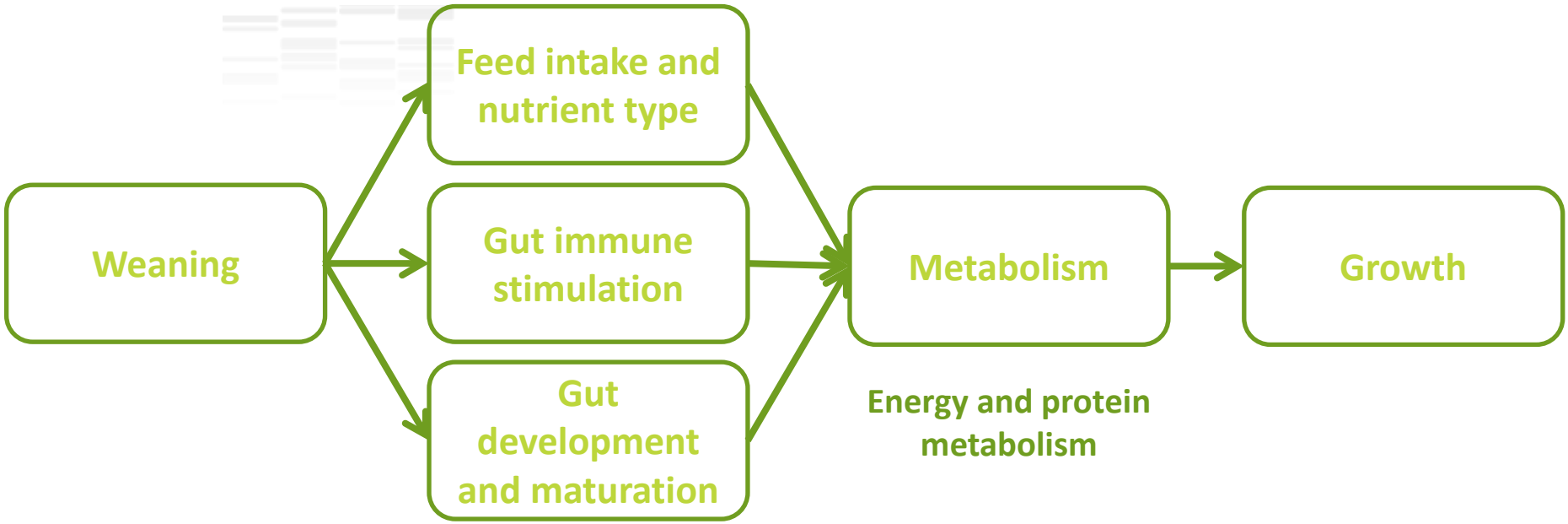
EAAP, Sep 1st, 2016

Introduction



Identification of biomarkers of the robustness of piglets at weaning

Introduction



Can metabolic parameters be used as biomarkers of adaptation to weaning?
How do they change according to weaning conditions?

Material and Methods

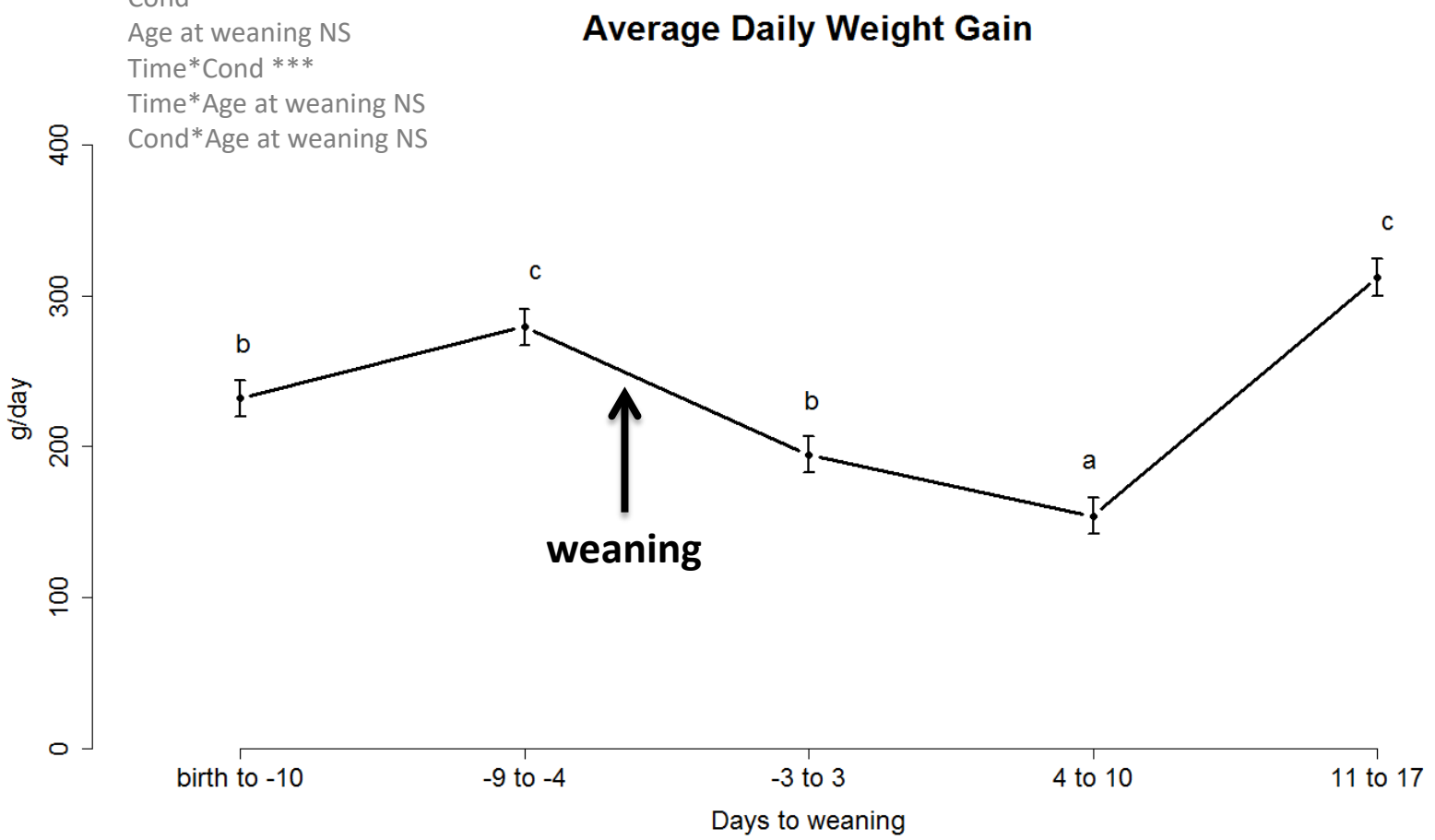
- 4 groups of 16 animals
  - Weaning at 21 or 28 days of age (to dissociate weaning from age effect)
  - Deteriorated or Optimal Conditions

Conditions	Optimal (OC)	Deteriorated (DC)
Density	4 piglets/pen	8 piglets/pen
Animals mixing	2 litters/pen	8 litters/pen Animals mixing 1 week after weaning
Room cleanliness	Cleaned + disinfected	Non Cleaned + non disinfected
Temperature during animals transfer	Directly at 28°C	4h waiting at 20°C
Transition feed 1st Age/2nd age	On 3 days	Direct

  - No antibiotic treatment
  - Blood samplings in fasting state, weighing and clinical observations from 12 to 61 days of age

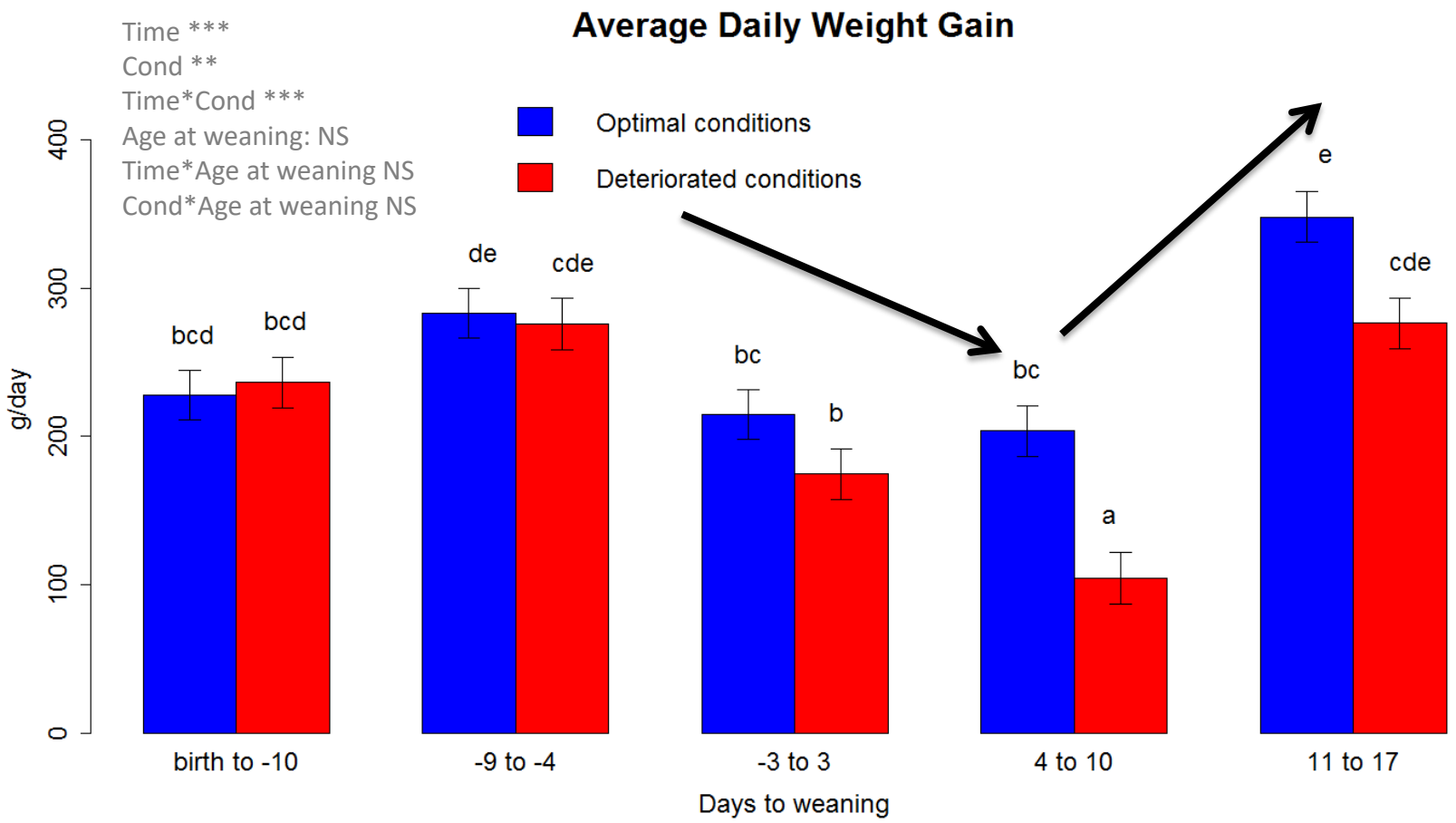
Reduction of growth rate around weaning

Time ***
Cond **
Age at weaning NS
Time*Cond ***
Time*Age at weaning NS
Cond*Age at weaning NS



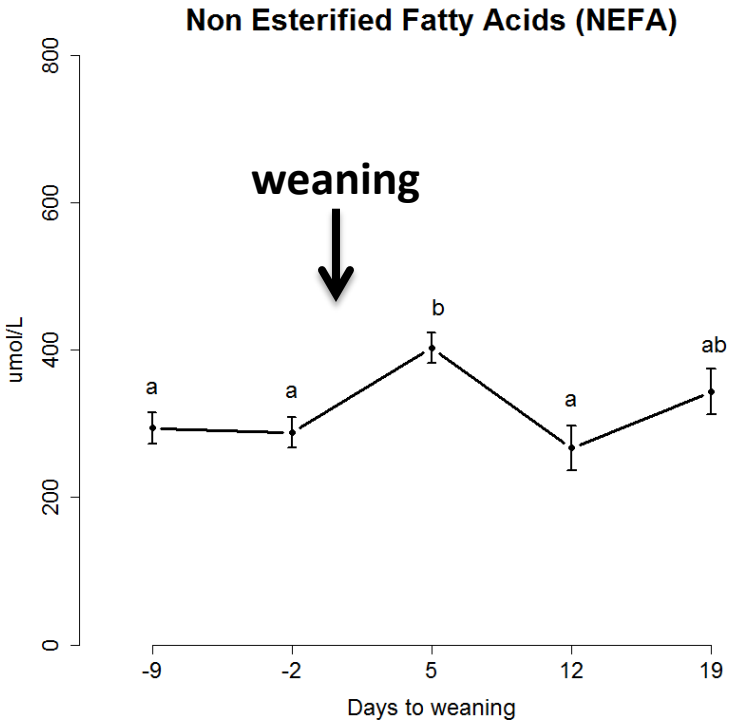
More severe reduction of growth rate in deteriorated conditions around weaning

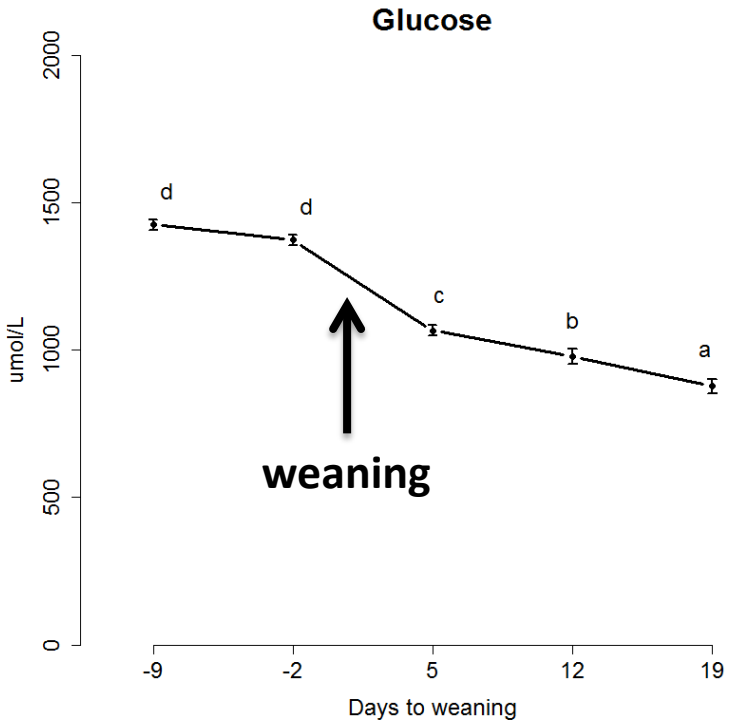
Time ***
Cond **
Time*Cond ***
Age at weaning: NS
Time*Age at weaning NS
Cond*Age at weaning NS



No effect of age at weaning

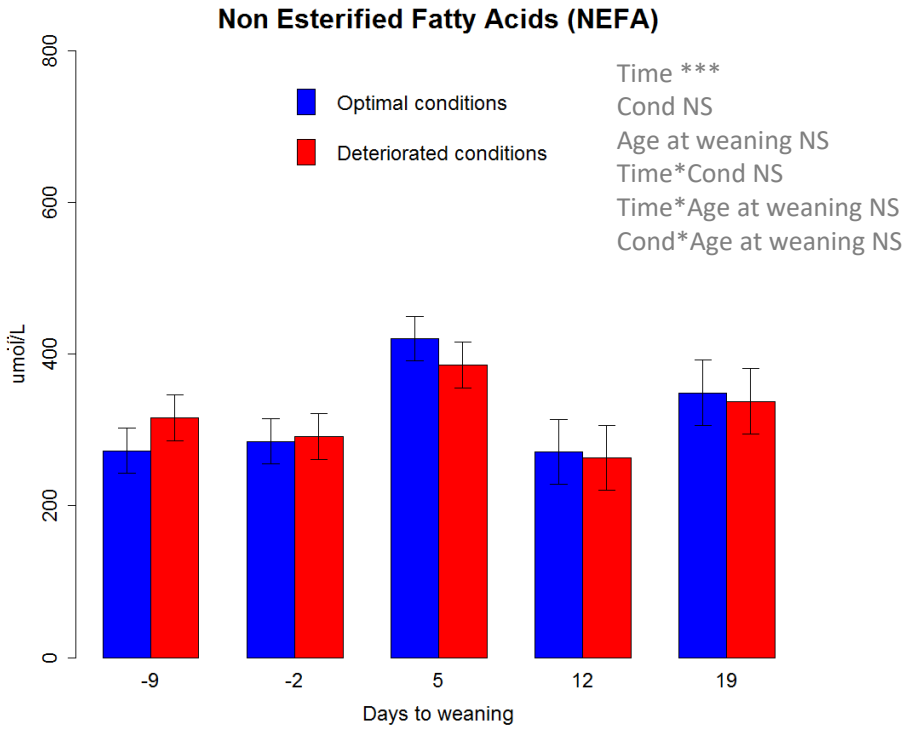
Lipid catabolism increased at weaning

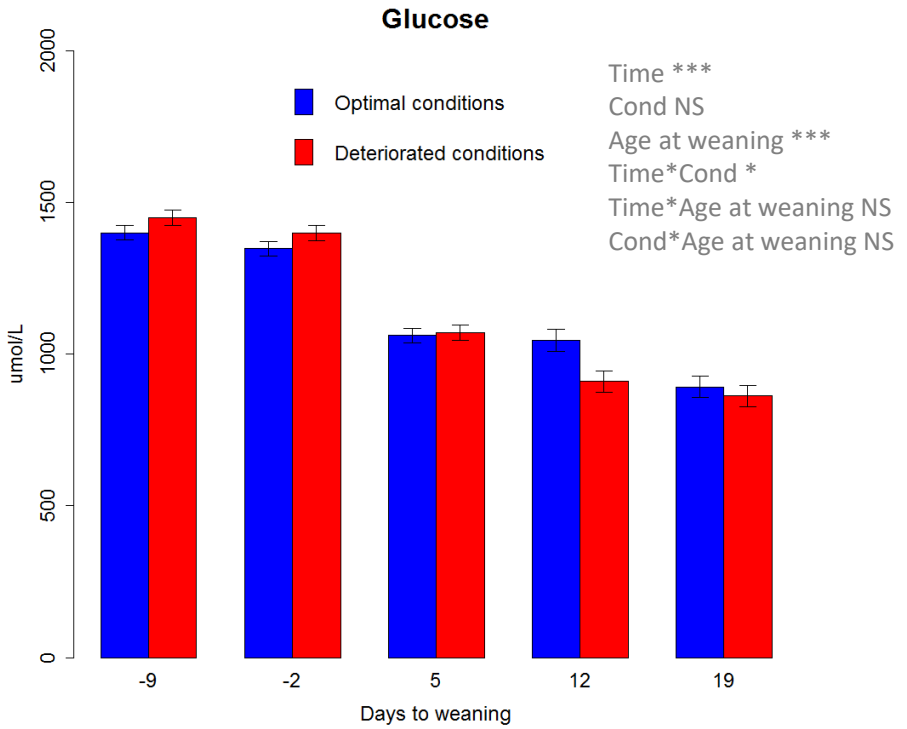




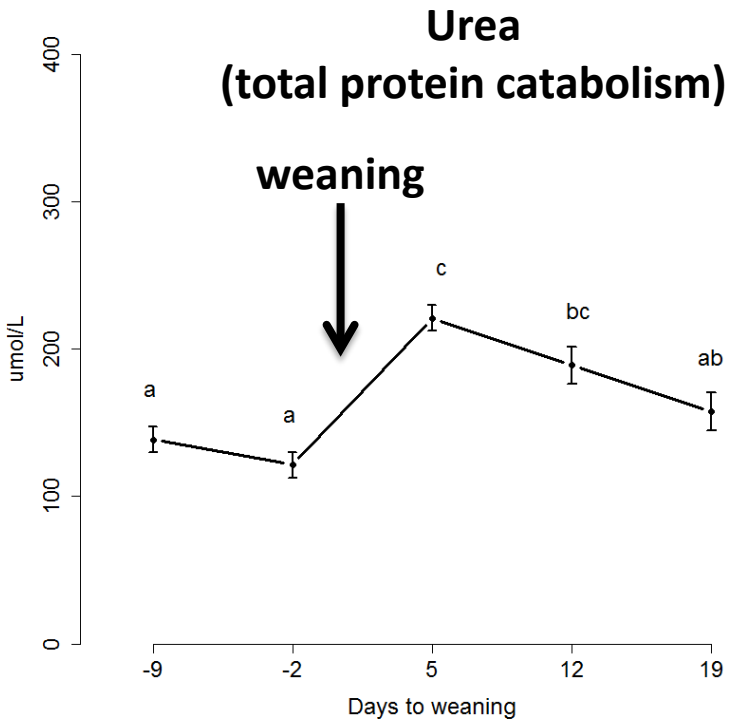
- Transient ↗ NEFA after weaning
- ↘ Glucose starting at weaning

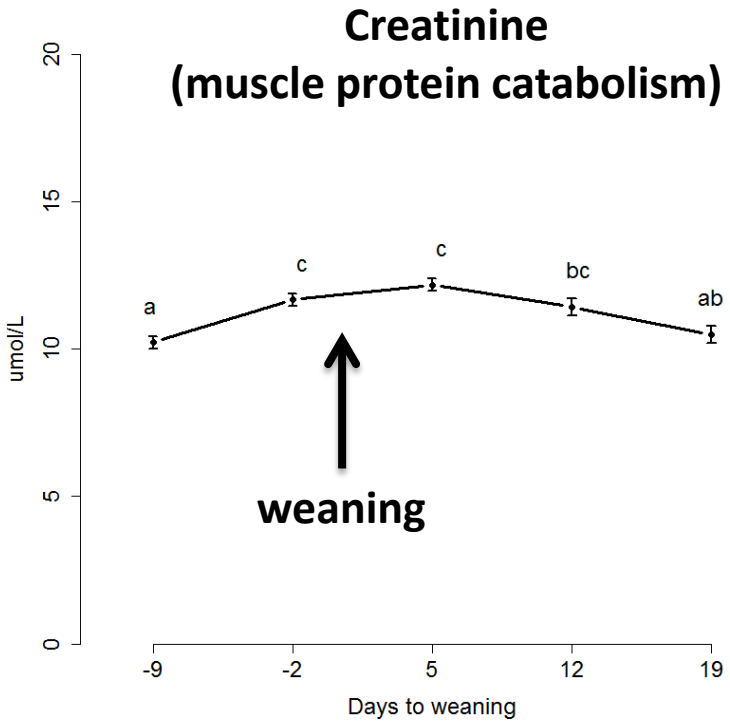
No apparent effect of management conditions on glucose and lipid metabolism



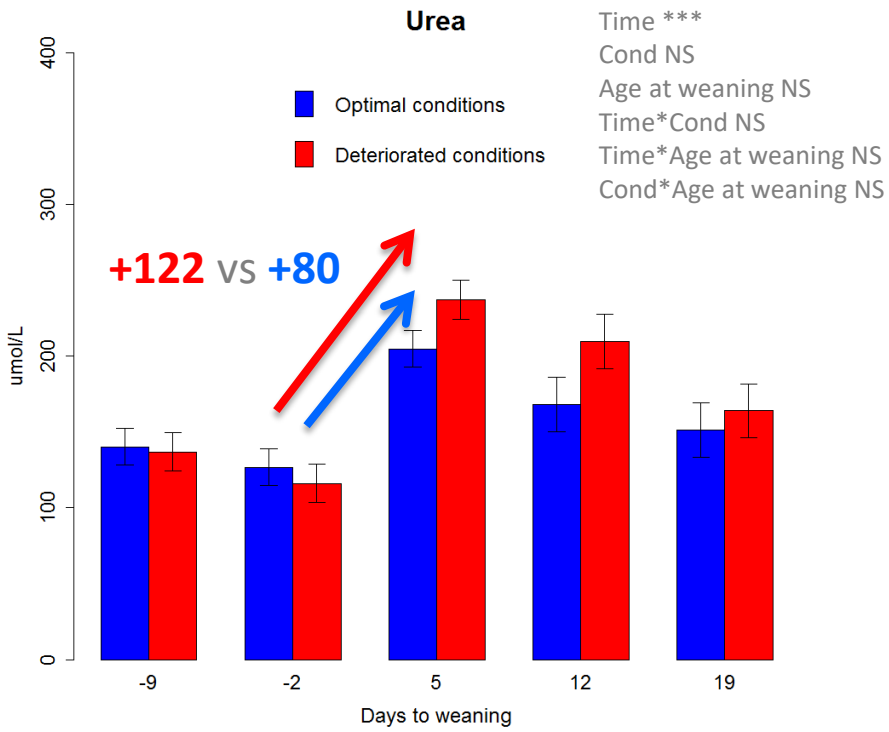


Higher protein catabolism at weaning

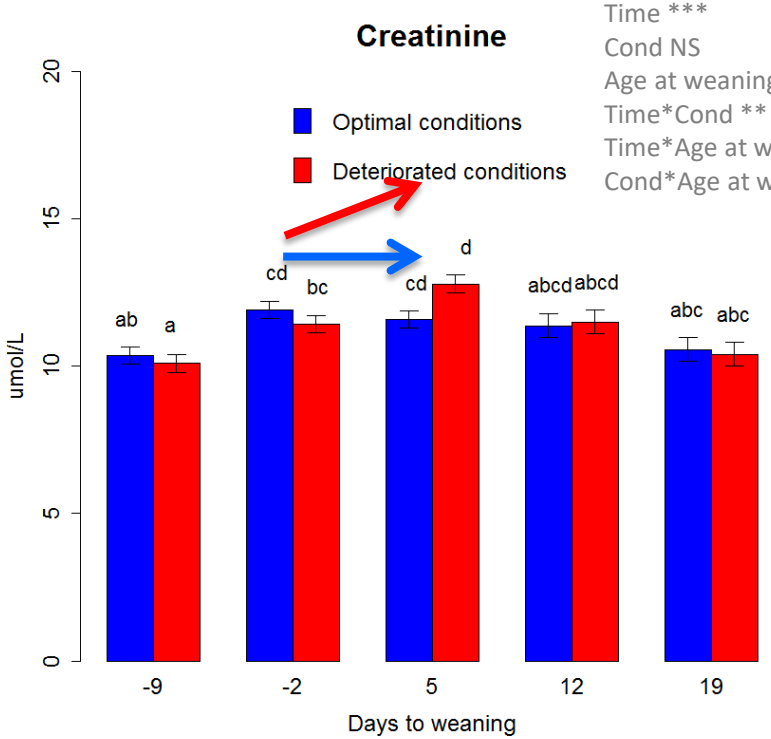




Higher protein catabolism at weaning for piglets in deteriorated conditions

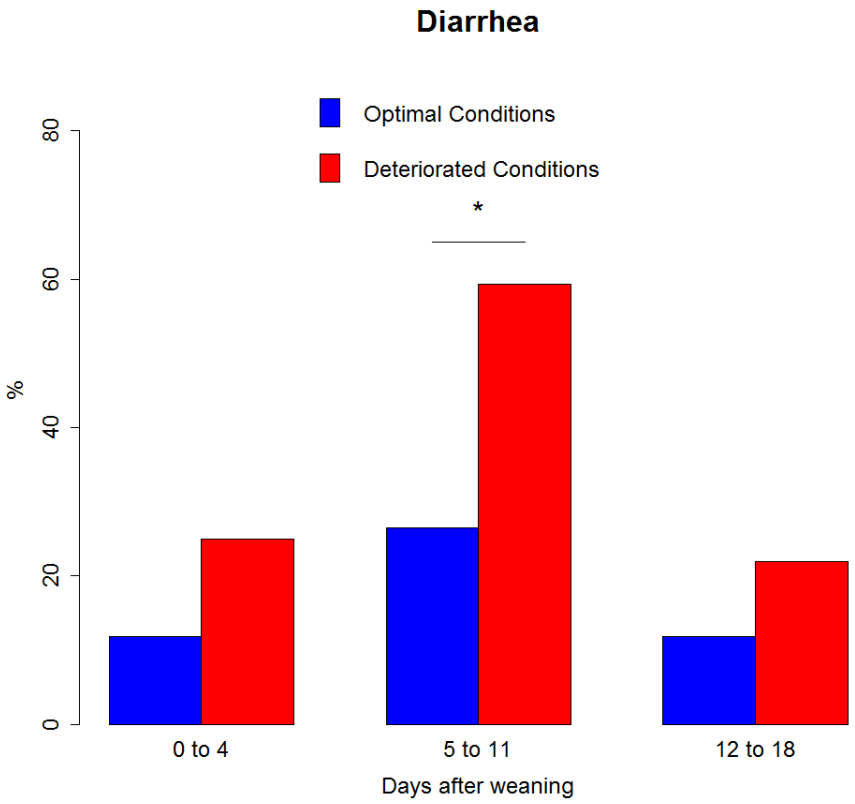


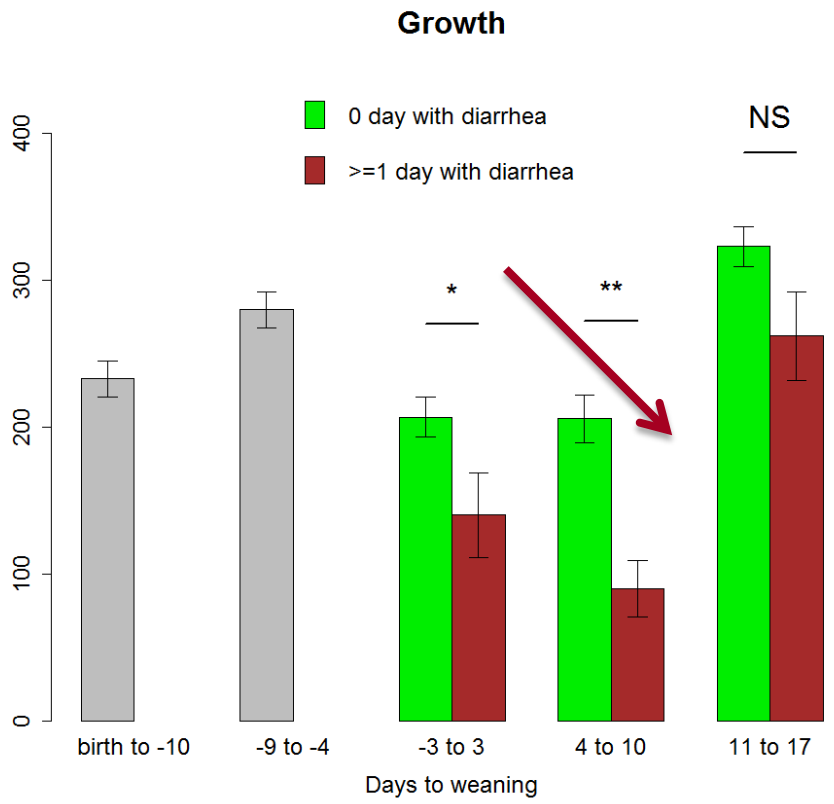
Time ***
Cond NS
Age at weaning NS
Time*Cond NS
Time*Age at weaning NS
Cond*Age at weaning NS



Time ***
Cond NS
Age at weaning **
Time*Cond **
Time*Age at weaning NS
Cond*Age at weaning NS

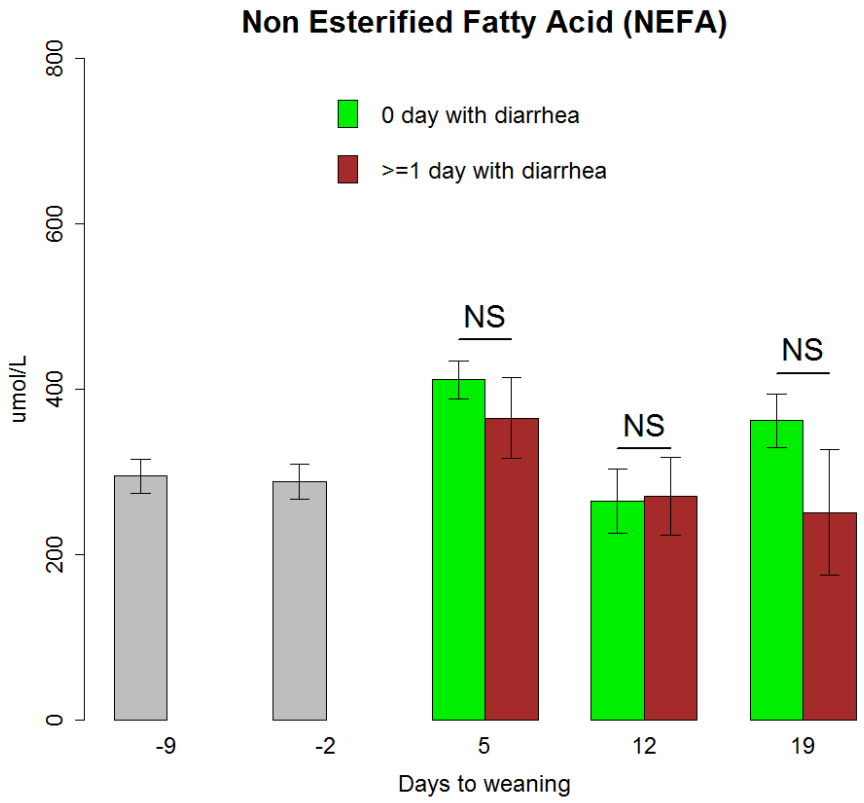
More diarrhea in deteriorated conditions

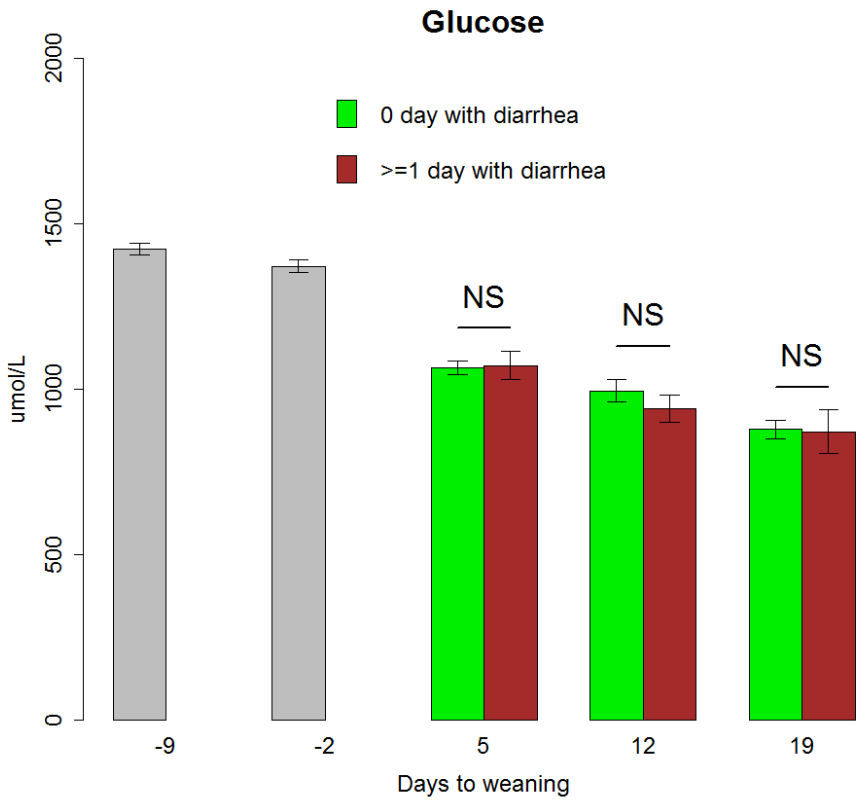




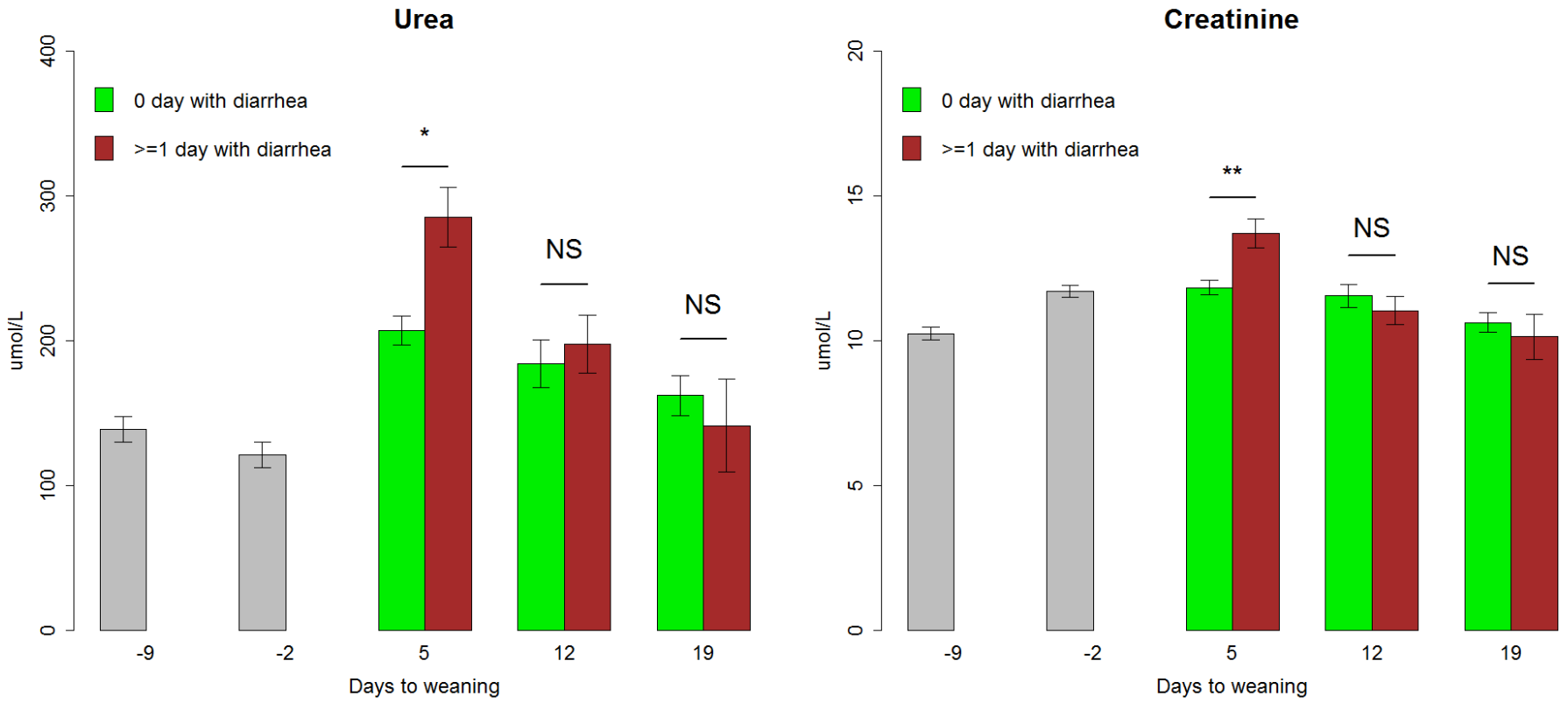
- More piglets with diarrhea in deteriorated conditions
- More severe slowing down of growth for piglets with diarrhea

No effect of diarrhea on energy parameters



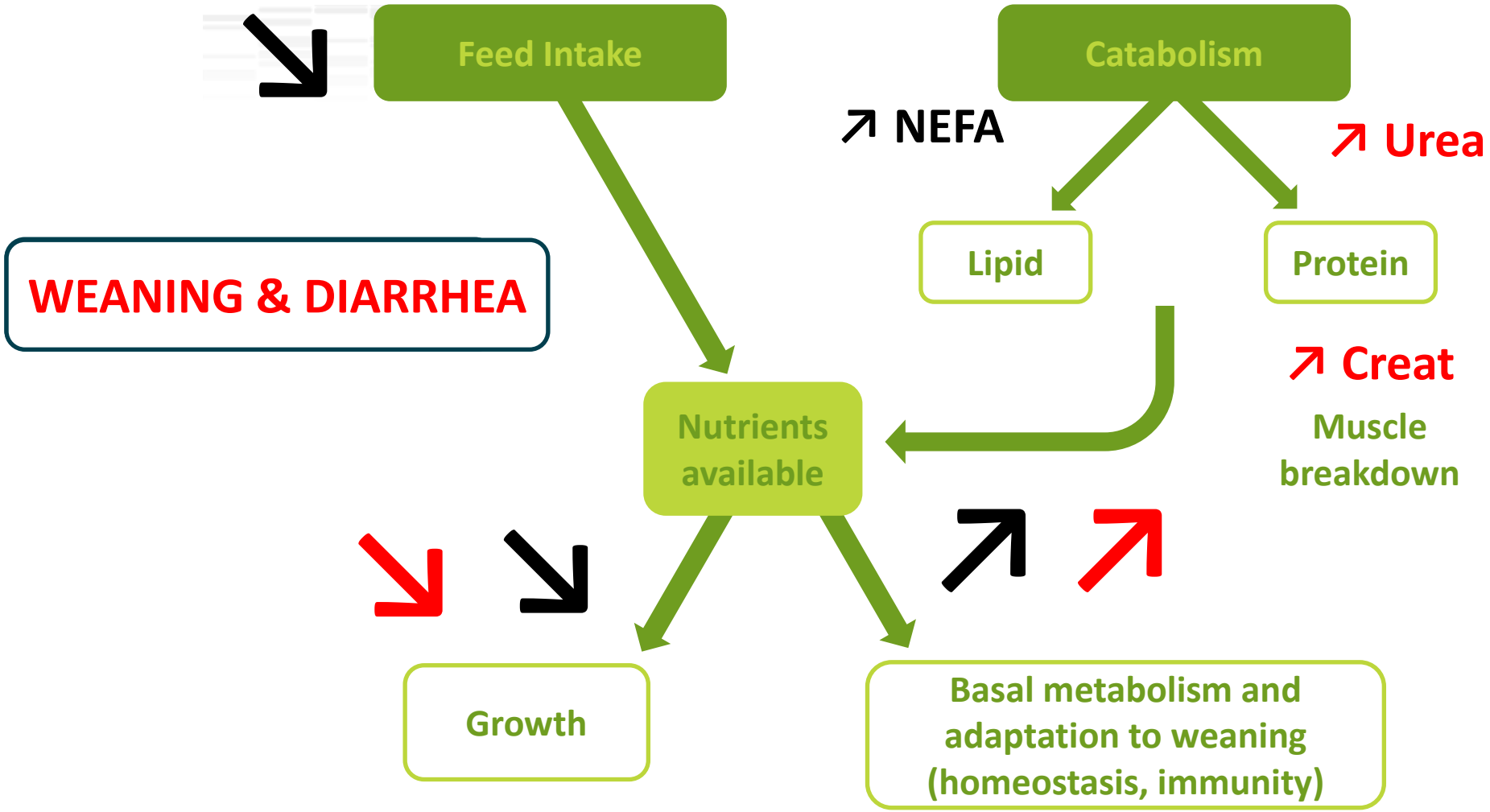


Greater protein catabolism after weaning for piglets with diarrhea

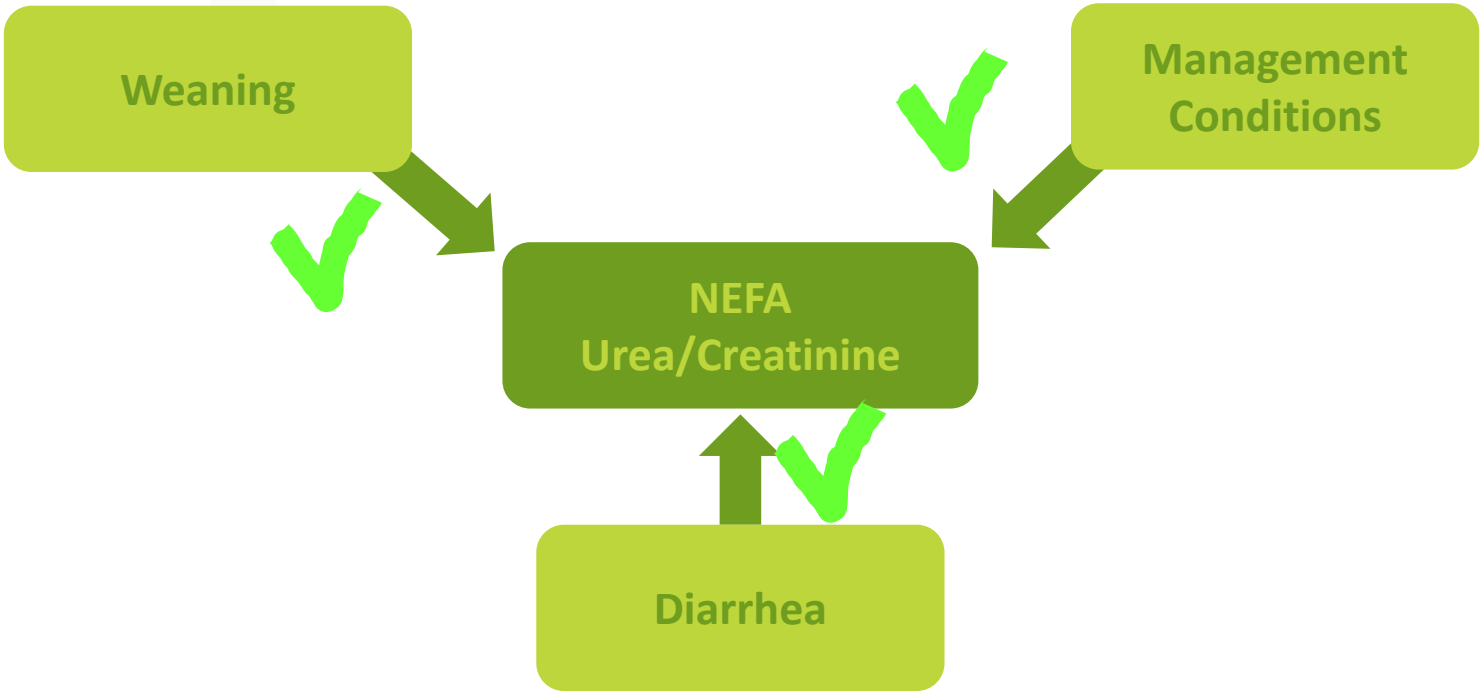


- Higher urea after weaning for piglets with diarrhea
- Higher creatinine after weaning for piglets with diarrhea

Conclusion


↘
Feed Intake
Catabolism
↗ NEFA
↗ Urea
WEANING & DIARRHEA
Lipid
Protein
↗ Creat
Muscle breakdown
Nutrients available
↘ ↘
↗ ↗
Growth
Basal metabolism and adaptation to weaning (homeostasis, immunity)

Take home message



There is an opportunity to use these molecules as markers of adaptation to weaning

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