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Cattle hematology: Study of variations during the first 2 months of life

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Introduction

- Progress in hematology: Many hematological parameters can be studied in cattle medicine
 - **Moderns cell counters (fully automated)**
 - **Nevertheless differential leukocyte count must be performed by examination of stained blood films**
- To :
 - **screen the haemic system for abnormalities or a response to a disease**
 - **Confirm and define a hematological disorder**
- The ranges of values from healthy animals must be known : but establishment of references or normal values are few for calves
- Among the factors that can interfere or change cattle blood composition, age seems to be the most important one.



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PLAN

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 - **Fixed factors and correlations at birth**
 - **RBC, Hgb, Hct and RDW**
 - **Wintrobe's erythrocyte indices**
 - **Leukocytes**
 - **Thrombocytic parameters**
 - **Total proteins**
- Conclusion



Objectives

- Follow the changes of blood composition during the first months of life
 - **Two breeds: Montbeliard calves (dairy breed) and Charolais calves (beef breed)**
 - **Fed only with total cow milk (maternal or bulk tank milk)**
- To assess a correlation of blood parameters between cows and calves at birth
- To establish more accurate reference values for calves
- Help veterinarians in medical diagnosis and prognosis



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Materials and methods

- 21 calves , 2 seasons of calving
- Four blood sample : D0, D8, D30 and D60
- Blood analysis
 - Numeration of cells : Impedance cell counter ,CellyVet®
 - Differential leukocyte count : stained blood film
 - Total protein (refractometer)
- Statistical analysis (R)
 - Global analysis of blood changes during the first months of life
 - Few number of calves
 - Only two breeds, Fed with total cow milk



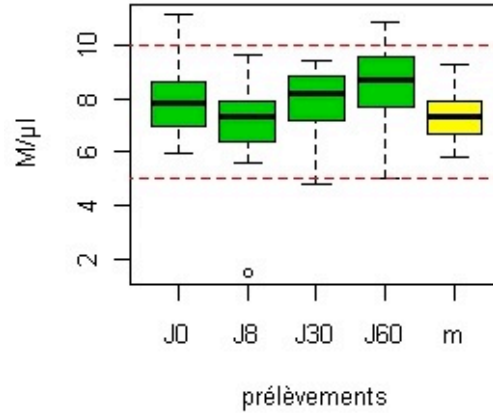
Influence of factors and correlations between cow and calves at birth

- **Influence of factors**
 - Breed : no influence displayed
 - Age : major factor of influence
- **Correlation cow-calf**
 - Significant for Wintrobe's erythrocyte indices (MCV, MCHC, MCH)
 - No other correlation could be described

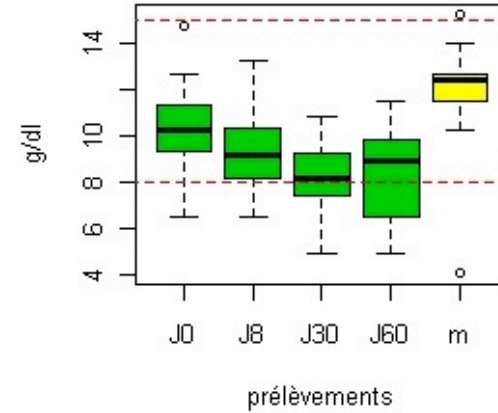


RBC, Hgb, Hct and RDW

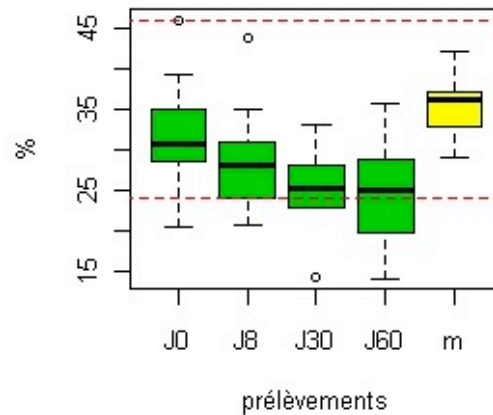
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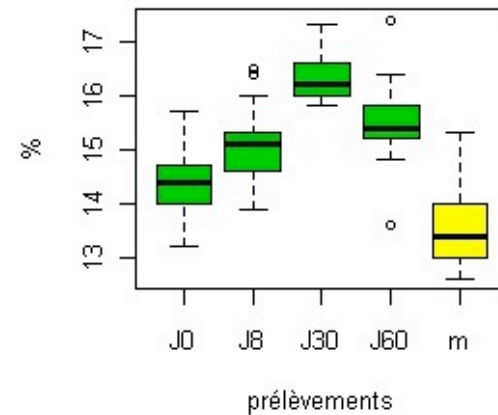
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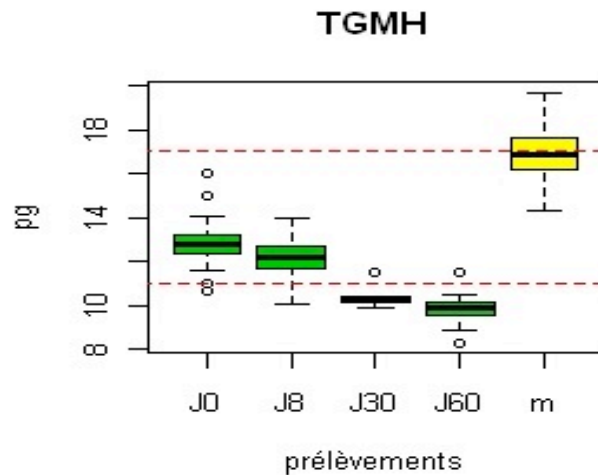
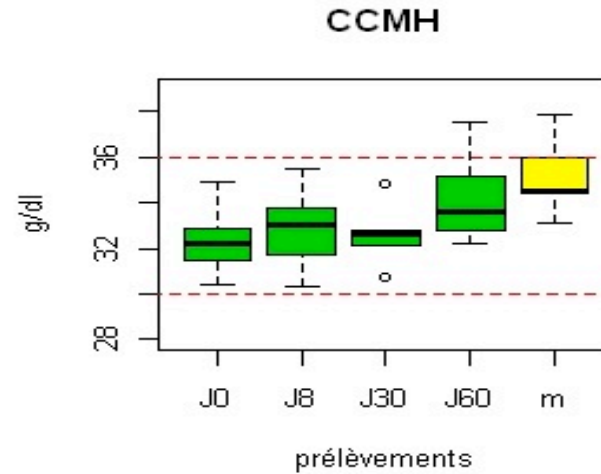
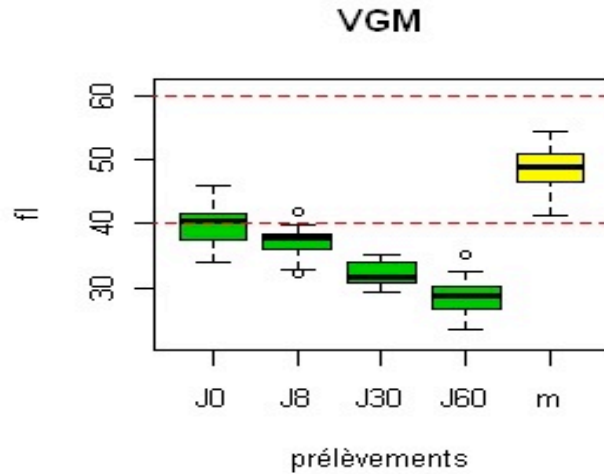
HCT



IDR



Wintrobe's erythrocyte indices



Development of physiologic and moderate anemia with fall of Hb and MCH

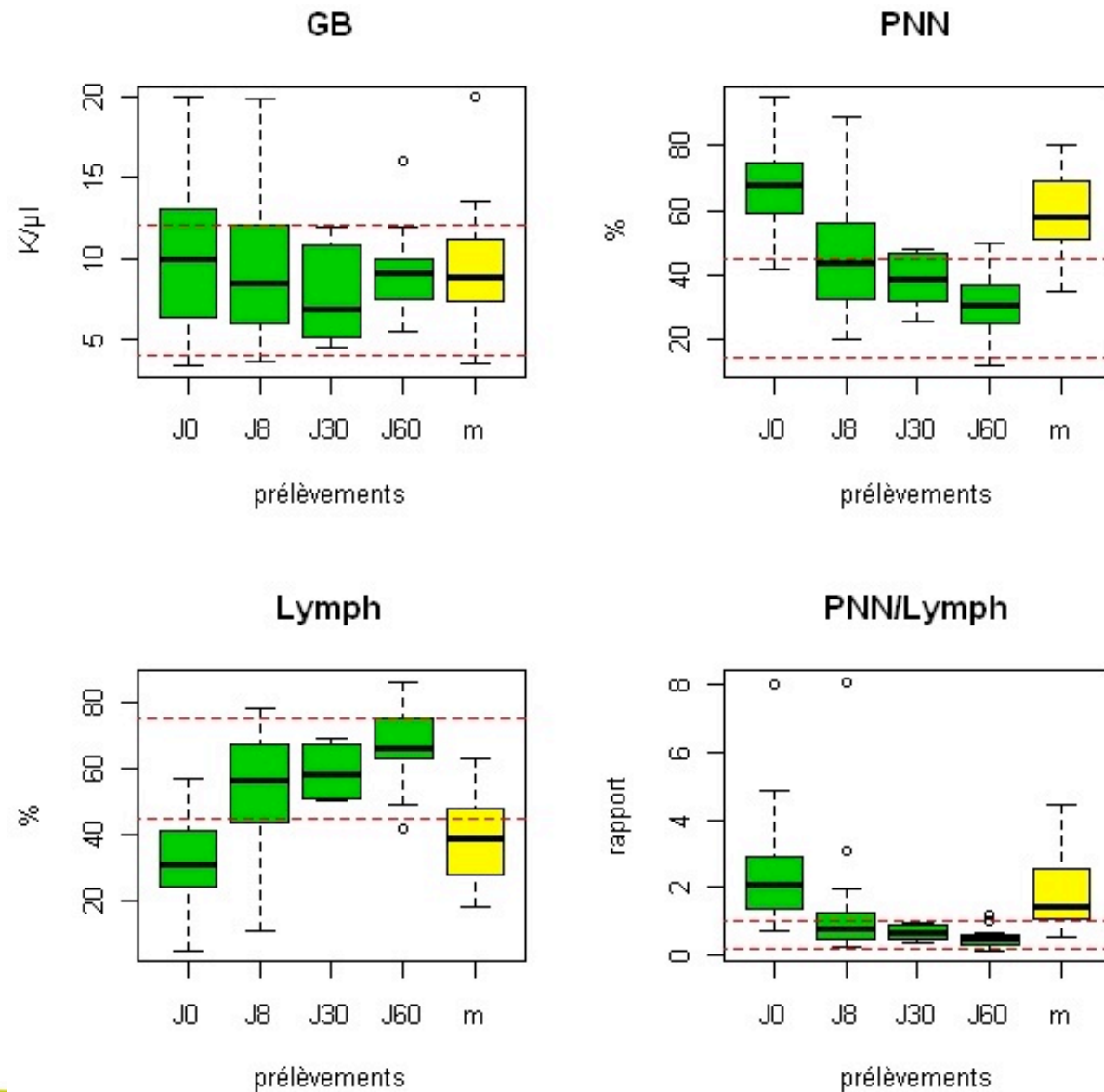


Leucocyte count

- Large range for total leukocyte count at least the first month : clinical interpretation difficult
- Modification of differential leukocyte count the first week : afterward it is similar to adult ratio and may allowed a clinical interpretation.

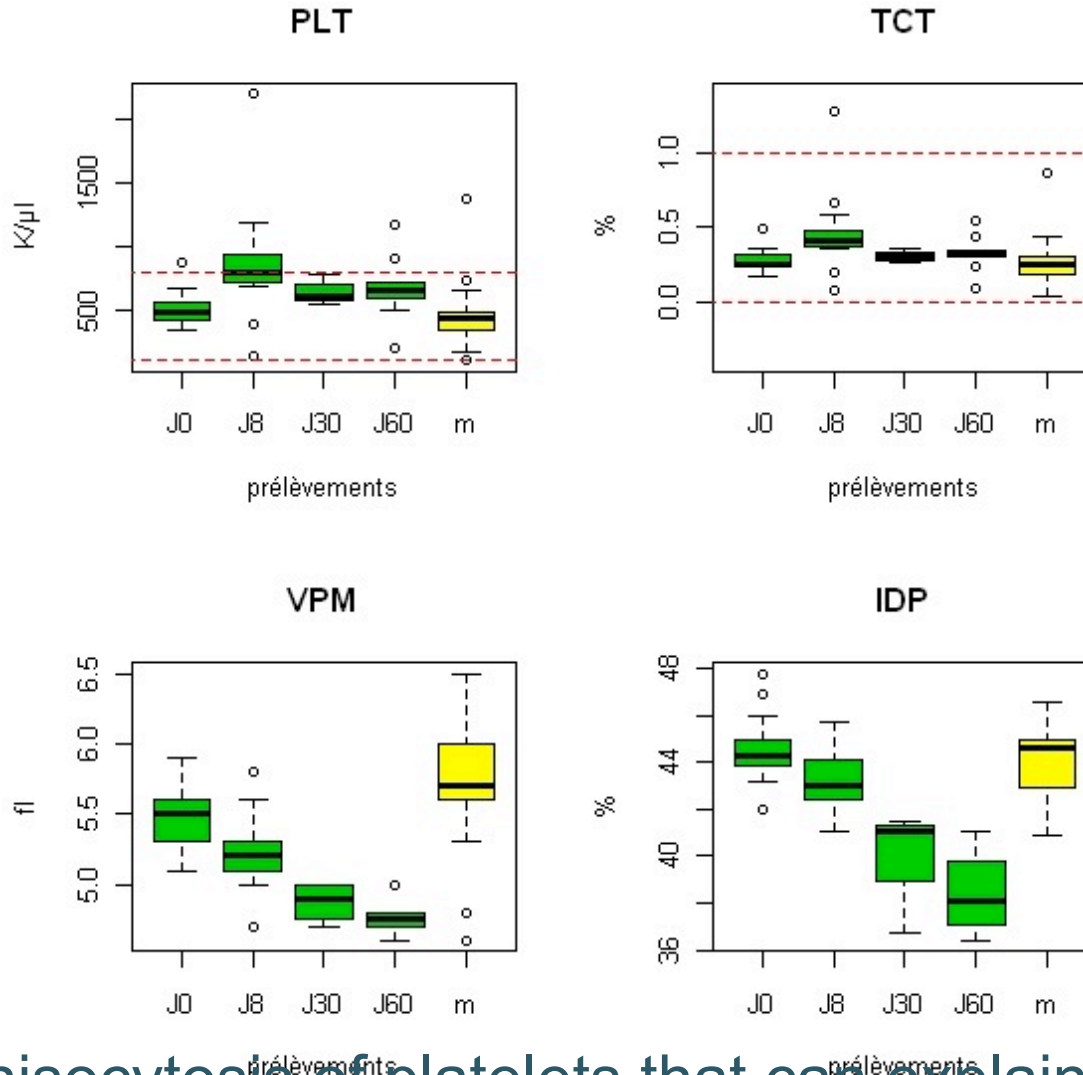


Leukocytes



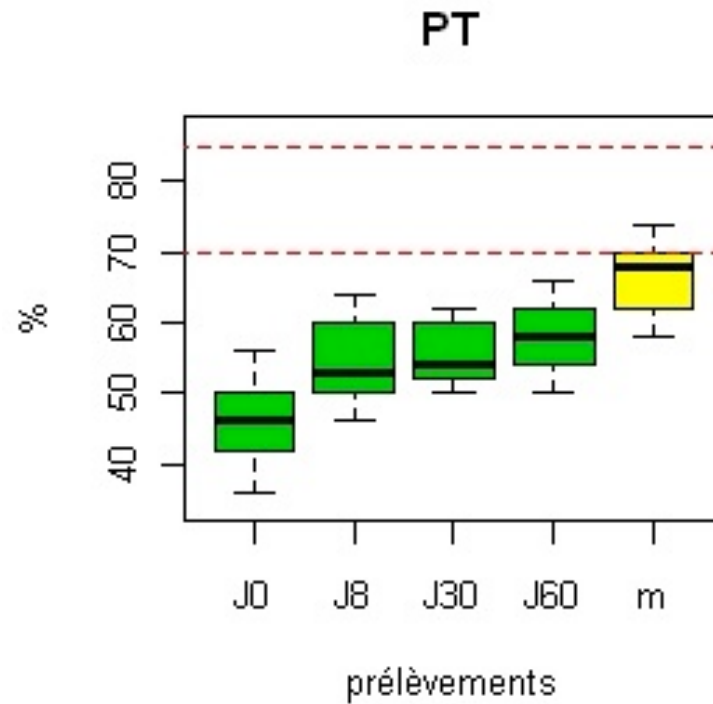


Thrombocytic parameters



Strong anisocytosis of platelets that can explain mistakes for automated counter's measures

Total proteins



Elevation of TP during the study but always weak compared to literature



Conclusion

- Development of physiologic and moderate anemia with fall of Hb and MCH
- Strong anisocytosis of platelets that can explain mistakes for automated counter's measures
- Large range for total leukocyte count at least the first month : clinical interpretation difficult
- Modification of differential leukocyte count the first week : afterward it is similar to adult ratio and may allowed a clinical interpretation.
- Elevation of TP during the study but always weak compared to literature



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Thank you for your attention