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Effet de la durée et de la température de conservation sur quelques paramètres hématologiques et biochimiques du sang des bovins à Ngaoundéré, Cameroun

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PLAN DE LA PRESENTATION

 **INTRODUCTION**

 **MATERIELS ET METHODES**

 **RESULTATS**

 **CONCLUSION**

INTRODUCTION 1/3

Analyses de sang:

- outil essentiel pour le diagnostic
- résultats erronés du fait de nombreux facteurs pouvant altérer les échantillons notamment,
 - distance séparant le lieu de prélèvement du laboratoire

INTRODUCTION 2/3

- coupures d'électricité
- type de conservation

(Tatsumi *et al.*, 2002; Schapkaitz *et al.*, 2015).

La nature et l'ampleur des altérations vont dépendre de la durée et de la température de conservation (Queen *et al.*, 2014)

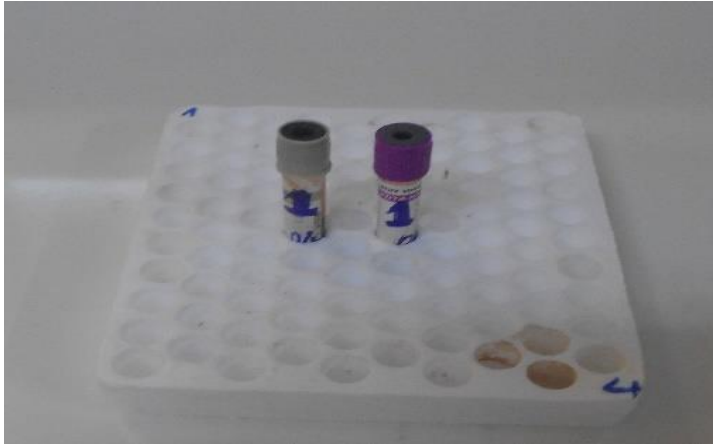
INTRODUCTION 3/3

L'objectif de l'étude était de déterminer le temps nécessaire à la conservation du sang sans modifications significatives de certains de ses paramètres à différentes températures de conservation.

MATERIELS ET METHODES 1/2

- Des échantillons de sang ont été collectés sur 30 bovins adultes cliniquement sains à l'abattoir municipal de Ngaoundéré
- Quelques paramètres hématologiques notamment, le nombre de globules rouges et blancs et l'hématocrite et biochimiques (Glucose, urée et Gamma glutamyl-transférase (GGT)) ont été évalués lorsque des échantillons de sang étaient conservés pendant 72 heures (6, 12, 24, 48 et 72 h):
 - à la température ambiante (26 - 31°C),
 - au réfrigérateur (4 ± 2 °C)
 - et dans des refroidisseurs utilisant des Blocs de glace (5 - 29°C) et de gel (4 - 29°C).

MATERIAL AND METHODS 2/2



**A-Température ambiante
(26- 31°C)**



**B-Refrigérateur
(4± 2°C)**



**C- Blocs de glace
(5- 29°C)**



**D- Block de gel
(4-29°C)**

RESULTS 1/6

Tableau 1: Variations du nombre de **globules blancs à différentes températures et conditions de conservation**

Globules blancs (x10⁹/L) et conditions de conservation

Durée de conservation (heure)	Température ambiante (°C)	Refrigerateur (°C)	Blocs de glace (°C)	Blocs de gel (°C)
0	10,46 ± 0,29 [29 ± 3]	10,46 ± 0,29 [4 ± 2]	10,46 ± 0,29 [5 ± 2]	10,46 ± 0,29 [4 ± 2]
6	8,31 ± 0,48 [31 ± 4]	8,60 ± 0,52 [4 ± 2]	10,58 ± 0,26 [5 ± 3]	10,37 ± 0,62 [4 ± 2]
12	7,81 ± 0,55 [31 ± 4]	9,94 ± 0,41 [4 ± 2]	9,79 ± 0,37 [6 ± 2]	10,37 ± 0,40 [5 ± 3]
24	6,86 ± 4,77* [31 ± 2]	9,54 ± 0,81 [4 ± 2]	10,50 ± 0,10 [9 ± 2]	10,50 ± 0,09 [6 ± 4]
48	5,35 ± 0,44* [31 ± 2]	5,02 ± 0,32* [4 ± 2]	5,63 ± 0,29* [28 ± 2]	5,93 ± 0,21* [27 ± 4]
72	4,84 ± 0,15* [30 ± 4]	4,6 ± 0,16 [4 ± 2]	4,65 ± 0,32 [29 ± 3]	4,88 ± 0,21* [28 ± 4]

❑ Sensitivity of WBCs higher T° ≥ 27 °C Cora *et al.* (2011)

RESULTS 2/6

Table 2: Changes in **RBC** of cattle blood at different storage T°

Red blood cells (x10¹²/L) and storage conditions

Duration of storage [h]	Room temperature [°C]	Refrigerator [°C]	Ice packs [°C]	Gel packs [°C]
0	7,68 ± 0,10 [29 ± 3]	7,68 ± 0,10 [4 ± 2]	7,68 ± 0,10 [5 ± 2]	7,68 ± 0,10 [4 ± 2]
6	7,68 ± 0,10 [31 ± 4]	7,91 ± 0,11 [4 ± 2]	7,73 ± 0,44 [5 ± 3]	7,67 ± 0,16 [4 ± 2]
12	7,21 ± 0,19 [31 ± 4]	7,95 ± 0,22 [4 ± 2]	7,96 ± 0,21 [6 ± 2]	7,71 ± 0,26 [5 ± 3]
24	7,97 ± 0,10 [31 ± 2]	7,46 ± 0,11 [4 ± 2]	8,02 ± 0,10 [9 ± 2]	7,81 ± 0,10 [6 ± 4]
48	9,23 ± 0,22* [31 ± 2]	8,01 ± 0,28 [4 ± 2]	9,95 ± 0,15* [28 ± 2]	9,16 ± 0,16* [27 ± 4]
72	9,63 ± 0,23* [30 ± 4]	9,2 ± 0,64* [4 ± 2]	10,17 ± 0,58* [29 ± 3]	10,95 ± 0,21* [28 ± 4]

Cora *et al.* (2011): Increase in temperature causing evaporation of water thus increasing concentration of RBC

RESULTS 3/6

Table 3: Changes in **PCV of cattle blood samples at different T °C**

Duration of storage [hour]	PCV (%)			
	Room temperature [°C]	Refrigerator [°C]	Gel packs [°C]	Gel packs [°C]
0	32,4±0,56 [29 ± 3]	32,4 ± 0,56 [4 ± 2]	32,4±0,56 [5 ± 2]	32,4±0,56 [4 ± 2]
6	33,37±1,37 [31± 4]	33,30 ± 1,42 [4 ± 2]	33,60±1,50 [5 ± 3]	33,87±1,74 [4 ± 2]
12	32,4±0,56 [31± 4]	32,4±0,56 [4 ± 2]	32,4±0,56 [6 ± 2]	32,4±0,56 [5 ± 3]
24	32,4±0,56 [31± 2]	32,4±0,56 [4 ± 2]	32,4±0,56 [9 ± 2]	32,4±0,56 [6 ± 4]
48	34,17±1,69 [31± 2]	33,34±1,31 [4 ± 2]	32,87±1,60 [28 ± 2]	33,3±1,38 [27 ± 4]
72	33,57±1,33 [30 ± 4]	33,57±1,33 [4 ± 2]	32,87±1,60 [29 ± 3]	33,3±1,38 [28 ± 4]

P>0,05 combined measure of blood cell numbers and sizes; though the number of RBCs do not increase , the sizes do, as a result of degenerative swelling. Ihedioha (2009).

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Table 4: Changes in **glucose** concentration of cattle blood samples at different T°

Duration of storage [hour]	Glucose (mg/L)			
	Room temperature [°C]	Refrigerator [°C]	Ice packs [°C]	Gel packs [°C]
0	128,99 ± 7,69 [29 ± 3]	128,99 ± 7,69 [4 ± 2]	128,99 ± 7,69 [5 ± 2]	128,99 ± 7,69 [4 ± 2]
6	138,86 ± 43,99 [31 ± 4]	122,41 ± 35,03 [4 ± 2]	128,09 ± 19,34 [5 ± 3]	127,32 ± 12,59 [4 ± 2]
12	129,69 ± 14,97 [31 ± 4]	121,25 ± 4,76 [4 ± 2]	127,61 ± 5,82 [6 ± 2]	123,03 ± 12,05 [5 ± 3]
24	86,01 ± 7,69* [31 ± 2]	121,12 ± 7,69 [4 ± 2]	118,80 ± 7,69 [9 ± 2]	122,77 ± 7,69 [6 ± 4]
48	93,70 ± 15,94* [31 ± 2]	98,38 ± 20,20* [4 ± 2]	71,14 ± 11,45* [28 ± 2]	82,49 ± 16,89* [27 ± 4]
72	59,94 ± 10,3* [30 ± 4]	73,63 ± 10,89* [4 ± 2]	55,05 ± 9,59* [29 ± 3]	62,24 ± 11,42* [28 ± 4]

Glucose is continued in vitro within blood cells causing the glucose concentration to fall. Marjani, (2006).

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Table 5: Changes in **GGT** concentration of cattle blood samples at different T°

Duration of storage [hour]	GGT (U/L)			
	Room temperature [°C]	Refrigerator [°C]	Ice packs [°C]	Gel packs [°C]
0	15,02 ±7,05 [29 ± 3]	15,02±7,05 [4 ± 2]	15,02±7,05 [5 ± 2]	15,02±7,05 [4 ± 2]
6	14,91±11,13 [31± 4]	15,23±61,84 [4 ± 2]	15,83±46,74 [5 ± 3]	15,39±53,81 [4 ± 2]
12	15,20±5,62 [31± 4]	15,90±3,39 [4 ± 2]	15,81±7,61 [6 ± 2]	15,96±18,63 [5 ± 3]
24	17,77±3,21 [31± 2]	15,98±5,12 [4 ± 2]	16,12±1,12 [9 ± 2]	16,23±0,12 [6 ± 4]
48	30,04±5,50* [31± 2]	16,34±4,64 [4 ± 2]	33,88±8,16* [28 ± 2]	29,52±7,87* [27 ± 4]
72	32,43±3,56* [30 ± 4]	16,61±5,63 [4 ± 2]	46,3±2,84* [29 ± 3]	36,76±2,84* [28 ± 4]

Divya, (2014) increase in temperature increases rate of collision between enzyme and substrate thus increasing GGT activity.

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Table 6: Changes in blood **urea** concentration of cattle blood at different T°

Duration of storage [hour]	Urea (mg/L)			
	Room temperature [°C]	Refrigerator [°C]	Ice packs [°C]	Gel packs [°C]
0	21,49 ± 5,62 [29 ± 3]	21,49 ± 5,62 [4 ± 2]	21,49 ± 5,62 [5 ± 2]	21,49 ± 5,62 [4 ± 2]
6	19,81 ± 3,76 [31 ± 4]	20,2 ± 3,43 [4 ± 2]	19,57 ± 5,25 [5 ± 3]	19,65 ± 3,36 [4 ± 2]
12	18,88 ± 4,12 [31 ± 4]	19,60 ± 3,58 [4 ± 2]	19,01 ± 5,54 [6 ± 2]	19,65 ± 3,17 [5 ± 3]
24	18,98 ± 1,96 [31 ± 2]	18,84 ± 1,96 [4 ± 2]	18,25 ± 1,96 [9 ± 2]	19,34 ± 1,96 [6 ± 4]
48	17,2 ± 3,35* [31 ± 2]	18,6 5± 2,81 [4 ± 2]	17,41 ± 2,75* [28 ± 2]	17,50 ± 2,04* [27 ± 4]
72	17,2 ± 2,23* [30 ± 4]	18,46 ± 2,69 [4 ± 2]	17,17 ± 2,46* [29 ± 3]	17,36 ± 1,95* [28 ± 4]

CONCLUSION 1/5

- ❑ **RBC counts values** remain stable at 4 °C for 48 hours and whereas stability is for 24 hours at RT, ice and gel packs
- ❑ **WBC count values** remain stable for 24 hours at 4 °C, in ice and gel packs meanwhile at room temperature values remained stable for 12 hours

CONCLUSION 2/5

- ❑ **PCV:** No significant change in all the storage conditions
- ❑ **Glucose:** Remained stable within 12 hours at room temperature and for 24 hours in refrigerator ice and gel packs

CONCLUSION 3/5

- **GGT:** Remained stable for 72 hours at 4 °C and for 24 hours at room temperature, in ice and gel packs

CONCLUSION 4/5

☐ Recommendations

- ☐ Refrigeration at 4 °C should be done if samples are to be analysed within 48 hours except WBC count and [Glucose]
- ☐ Storage of samples in Ice or gel packs $\leq$ 24 hours
- ☐ Ambient temperature $\leq$ 12hours

CONCLUSION 5/5

Perspectives

- **More work using other storage material (e.g. liquid nitrogen)**
- **Shorter time intervals (e.g 0, 30, 60, 90,120 minutes etc.)**
- **Different climatic zones of the country using other species of animals (cats, dogs, sheeps goats, etc.)**

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