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Incidence and aetiology of calf neonatal diarrhoea in Blida Algeria

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Abstract
Neonatal calf diarrhoea is the most important disease of neonatal calves and results in the greatest economic losses due to disease in this age group in both dairy and beef calves the objectives of the present study ware to estimate the morbidity and the mortality of neonatal diarrhoea in dairy calves also to determine aetiology and risk factors were caused a diarrhoea in dairy veal under 60 days old. A total of 324 claves, housed in 30dairy breeding were followed during two velage season from January to Juan 2013. The total mortality was 5, 9% and was significantly higher in calves had less than 15 days of age. The incidence rate of diarrhoea was 31, 5% and peaked in the first two week after velage.
The main causes were breeding controls, defect of passive immunity, old of calf, production season, and nutrient of pregnant cattle, veal's housing and infectious agents.
ELISA test on 22 fecal samples revealed that the 31, 82% of dairy breeding were infected, by cryptosporidium parvum in 13, 6% of study population, E. Coli F5 in 9% and Rotavirus with rate of 4, 5%.

Keywords: Neonatal, diarrhoea, mortality, incidence, risks factors

1. Introduction
Diarrhoea in young pre-weaned calves is one of the most important causes of calves morbidity and mortality [2]. Disease incidence in young calves has Un adverse effect on their immediate health status, longevity in the herd and productivity performance and thus causes great economic loss [3]. In order to increase productivity of area study livestock, it is important to identify the etiological and risk factors involved in calf diarrhoea in order to devise preventive measures and reduce losses during the initial months of life.

2. Materials and Methods
2.1 Data collection
2.1.1 Registration of Diarrhoea and Mortality Data: A case of mortality and morbidity of calf under 60 days of age was determinate by weekly visits to 30 farms in region of Blida. The study population was randomly selected within the lists of all area dairy breeding. The study was carried out by 324 dairy calves less than 60 days of age, with the means of followed cards we recorded the new diarrhoea cases and all the predisposing factors.

2.2 Samples Collect: 22 fecal samples were collected from 22 dairy farms; the calves sampled were under 60 days of age with clinical signs of diarrhoea, provided they had not received prior treatment with antibiotics.

2.3 Laboratory Analysis: it was carried by digestive ELISA kit antigenic provided by (Bio-X Diagnostics) for diagnosis test of *Rotavirus, Coronavirus, E. Coli F5* and *cryptosporidium* for bovines, it's one of direct test for faeces.

2.4 Statistical Analysis: a Statistica06 software analysis used for descriptive analysis and to compare the different average, showed a significant relation of risk factors and diarrhoea by means the chi-square test (χ^2),the significance was set at P<0,05.

3. Results

3.1 Descriptive Epidemiology

- **The Incidence**

During the investigation period, we recorded the birth of 324 calves with 59,25% in second half of the study(April-June) and 40,75% during the season of (January-March), the presence of diarrhoea were observed during the two season and in all the breeding included, with an incidence monthly combined of 19,6% up to 44%, the mortality consecutive of o diarrhoea episode was observed in 27 breeding studied (90%) with a higher rate in May 21, 3% and the absence in April.

Table 1: The incidence of neonatal diarrhoea in two production seasons.

Study period	Jan-March	April -June	Total
Number of calves	132	192	324
Number cases of diarrhoea	38	64	102
Number of dead calves	7	17	24
Morbidity	28.8%	33.3%	31,48%
Mortality	5.3%	8.85%	7,41%
lethality	18.4%	26.6%	23,53%
Incidence	21.2%	27.6%	31, 5%

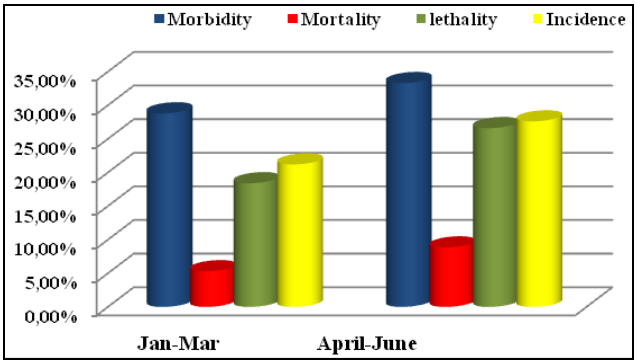

Fig 1: Distribution of death rate and the cumulated incidence in two study periods.

- **Mortality**

Overall, 324 calves of which 5, 9% died during two season of production and 31, 5% were presented the clinical symptoms of diarrhoea. The mortality rate was significantly higher in calves were 15 days of age during second study period. The diarrhoea symptoms peaked during April to June in calves had two week of age.

Table 2: Mortality and incidence rate according to the age.

Class of age	Number of calfs	Incidence	Mortality
1-7days	111	36.04%	7.21%
8-15days	75	53.33%	16.00%
16-30days	84	47.62%	2.38%
1-2 month	54	12.96%	3.70%

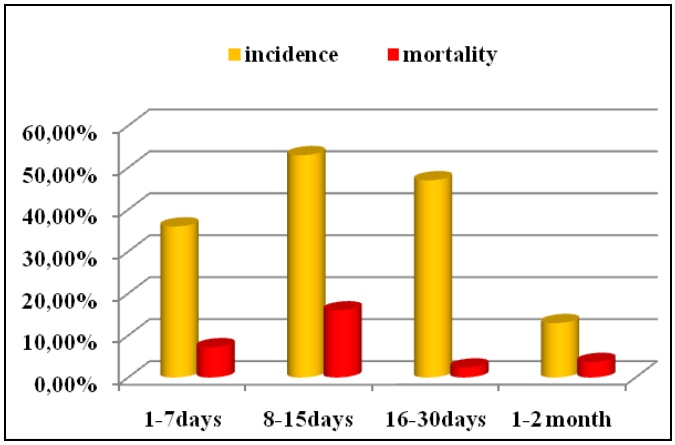

Fig 2: Mortality and incidence rate according to the age.

3.2 Risk factors

The analytical study showed that the nutrient of adult cattle, quality and quantity of colostrums, disinfection of buildings, calf's housing were the important factors associated with calf neonatal diarrhoea.

Table 3: Risks factors associated with calf neonatal diarrhoea.

Variable	Method	% D	χ^2 (p)
supplementation of the ration of the pregnant cattle	Yes	8, 02	0,02
	Non	23, 46	
Practical of drying up	Yes	14, 51	0,01
	Non	16, 98	
Quantity of colostrums catch	sufficient	7, 4	0,04
	insufficient	24, 07	
Hygiene of the cattle shed	good	11, 75	0,002
	bad	19, 73	
systematic disinfection of velage buildings	Yes	13, 89	0,04
	Non	17, 59	
systematic disinfection of buildings of parking of calves	Yes	7, 41	0,01
	Non	24, 07	
Type of parking	Collective	24, 38	0.04
	individual	7, 1	

%D: incidence of the diarrhoea,
P: significance of chi-square (χ^2) test.

3.3 Laboratory analysis

The antigenic research reveals the presence of three infectious agents in 7 faecal samples or 31,8% of breeding were infected by *cryptosporidium parvum* with 13,6%, *E. Coli F5* in 9% of population included and *Rotavirus* with 4,5%.

Table 4: Prevalence of pathogen agents detected.

Entomopathogens Agents detected	calves (n = 22)	
	Number	%
No agent	15	68,18
Coronavirus	00	--

Rotavirus	1	4,54
Cryptosporidium parvum	3	13,63
E. Coli F5	2	9,09
Rotavirus + Cryptosporidium parvum	1	4,54

Table 5: Distribution of the positive cases according to the age.

Age classes	Number of samples	Number of positives cases
1-5 days	5	2 (40%)
6-15 days	6	3 (50%)
16-21days	5	1(20%)
22- 30 days	6	1(16, 6%)
Total	22	7 (31, 8%)

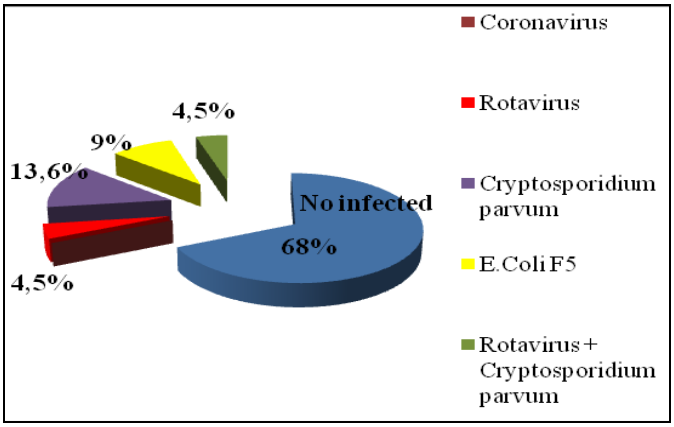

Fig 3: percentage of infectious agents detected in calves faeces.

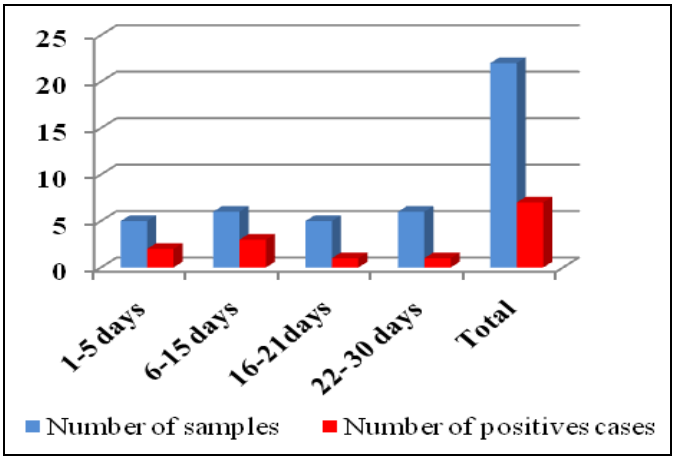

Fig 4: distribution of the infectious agents according to the age.

4. Discussion

Random sampling is the method of choice to obtain a representative sample of the population [4]. the survey results show that the diarrhoea remains a pathology major in dairy breeding in the region of Blida, and a crucial constraint has an important lethality (23,5%) in dairy calves. in the present study, the morbidity risk (31,5%) was higher than those is reported in France by Bendali (14,6%), Schuman (20,5%), Virtala (22%); bordering that given by Wells (24,5%) [4], it's inferior with those shown by Sfakssi in the east of Algeria (64%) and Fassi in Morocco (60%) [5]. a case-control study was performed to examine the possible involvement of various enteropathogens in diarrhoea by comparing the presence of these agents in the faeces of scoring calves younger than 2 months of age. We have detected just three enteropathogens *Rotavirus, E. ColiF5* and *Cryptosporidium parvum* with an important variation according the age. Other studies reported the presence of 4 enteropathogens *Rotavirus, Coronavirus, E. Coli F5* and *cryptosporidium parvum* in different area in Algeria [6]. The laboratory analysis is in agreement with studies of Khelèf and al in centre of Algeria into 2000, 2002, 2007 and 2009, which showed that *cryptosporidium parvum, E. Coli F5, Rotavirus* and *Coronavirus* are the 4 principal infectious agents implied in the calf neonatal diarrhoea with prevalence depend with the age of sick calves [7].

5. Conclusion

the diarrhoea is a very frequent diseases in diary calf, which can be caused by various infection agents affect more particularity the calves had 15 days of age, it generate losses economic considerable because of mortality raised at the new-born, it's thus necessary to put good conduits to limit their impact and more to undergo them, such as the good practice of vaccination against principal enteropathogens.

It's necessary to reinforce passive immunity in calves by the vaccination of the pregnant mothers in order to increase the rates of the antibody specific to principal enteropathogens.

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