



## Determine sedimentation rate of red blood cells in Iraqi camels and compare the value between diseased and healthy camels

Zahra M. Al-Hakak

Technical Institute of Karbala, Foundation of Technical Education, Karbala, Iraq.  
[zahramake@yahoo.com](mailto:zahramake@yahoo.com)

### Abstract

The objective of this study is to determine sedimentation rate of red blood cells in Iraqi camels and compare the value between diseased and healthy animals. A total of 100 samples of blood were collected from Iraqi camels. All samples were collected randomly from both sexes and from different ages ranged from (less than a year-12 years). Some camels were suffering from different diseases and injuries. The study included: General knowledge examination; (age of the animal, type of animal, color, history of the condition, drugs and vaccines used and the method of grazing) Second; Clinical examination included: First; Check the temperature, the speed of the pulse and breathing, auscultation of the heart by stethoscope, check covering of skin. Third; Measure the sedimentation rate of red blood cells (ESR) through three hours. Results showed a clinical examination that there are (36) animals was suffering from various diseases and (64) animal healthy. The results of the examination (ESR) values ranged in healthy animals in the first hour (0.33-1.6)mm/h, in the second hour (1.56-2.3)mm/h and in the third hour (2.66-3.44)mm/h While in sick camels the results of the examination (ESR) values ranged in the first hour (1.75-5) mm/h, in the second hour (5-13.5) mm/h and the third hour (7.75-19.5)mm/h.

The test results showed that (ESR) higher in animals that were suffering from the disease showed a statistical significant level of difference ( $P < 0.05$ ) between healthy and diseased camels. It recommended that must be do many other studies on the blood of camels for the lack of Arab library for such research and also to increase and deepen the field studies related to camels and must be supported by different facilities to successful the work.

Keywords: Camels, Red blood cells, Sedimentation Rate, Diseased, Healthy.

### Introduction

Camels play a vital role in the life of the Arab over the centuries and to this day, the technical developments subsequent did not affect to its location in the heart and conscience, they have become a part not only of its own food, but a means of Terviha, was not limited only to those who are the source of their livelihood, but they became part of the lives of the wealthy, where help them to get rid of many of the concerns and stresses of everyday life, provide them with psychological comfort because she likes to warm up to it, sponsored and softened (Sciences and Technology, 2004).

Arab treated camels (4000) years ago and cared for by a lot of extremely useful in their daily lives (ACSAD, 2002; Al-Ani *et al.*, 1990; Warda, 1989; ACSAD, 1980). The blood is one of the tissues important for the animal because of the dynamics that characterize and make it by virtue of his

ongoing and the organization felt the changes taking place in various cells and tissues of the body and that the study of these changes can be an accurate indicator of health status or physiological animal (Al-Janabi *et al.*, 1990).

Camels has distinguish immune system and distinct components of blood are different in terms of shape, number and chemical composition, in order to fit in with the environment in which they live with all this excellence are like other organisms are exposed to many diseases such as fever of unknown and mastitis, as it is the movement of some diseases to humans, such as Rift Valley fever (Sciences and Technology, 2004).

In spite of the importance and great benefit to the animal in the Arab countries, it has not been given attention to the good in terms of research and studies, affecting the level of production, especially when compared to research cows and sheep. And the importance of blood tests and the

results that show the validity and efficiency of the animal, which may appear as a health condition (Coles, 1986; Schalm, 1986) so this study was chosen to calculate the rate of deposition of the red blood cells (ESR) for the animals healthy and diseased to see value in both cases, whether to change its value in the Animal for the better and for the interest in this animal, albeit walking.

The objects of this study included general knowledge examination (age of the animal, the animal type, Join condition - medicines and vaccines used and the method of grazing and clinical examination included (check temperature, rapid pulse and breathing, auscultation of the heart by headset medical, Examination covering the skin also, determine the rate of deposition of the red blood cells ESR

### Materials and Methods

Research design: Search has been designed on the basis of the collection of blood samples from Iraqi camels, where collection (100) random samples of blood and over (6) months for the period from 1-10-2011 until 1-7-2012 and collected the forms as follows: -

1. Camels that graze naturally in the pastures of the desert in the western city of Najaf, the Sea of Najaf and Samawah.
2. Camels of the zoo in Baghdad.

3. Camels slaughtered in the massacre of Najaf and Qadisiyah, which may remain (1-2) a week in roofs, especially near the massacre feed on green fodder and concentrate.

The camels, which were collected samples of blood, some of them enjoy good health, others are not so good for her respiratory disease like pneumonia and pleurisy, inflammation of the udder, gastrointestinal diseases, wounds of various add to her skin diseases, presence of external and internal parasites, and some of them infected with trypanosomiasis (one disease blood parasites).

We took samples of blood from the camels and she camels in different ages ranged between (less than a year -12 years) and were divided into six groups according to age, as shown in Table (1) extracted the percentage of diseased and healthy animals as shown in Figure (1). Table (1) Shows how to divide the camels to six groups according to age, sex, healthy and diseased, and also shows that the number of healthy camels (36) animal and the number of diseased camels (64) of the total animal (100) animal.

Figure (1) shows the percentage of diseased was (36%), which include both sexes (camels and she camels) and healthy camels (64%) also for camels and she camels.

Table (1): Numbers and ages of camels for both sexes

Age - year	Sex	Number	Healthy	Diseased
Less than year- 2 years	Camel	22	16	6
Less than year- 2 years	She camel	13	9	4
3 years – 5 years	Camel	19	12	7
3 years – 5 years	She camel	13	8	5
6 years – 12 years	Camel	21	13	8
6 years – 12years	She camel	12	6	6
	Summation	100	64	36

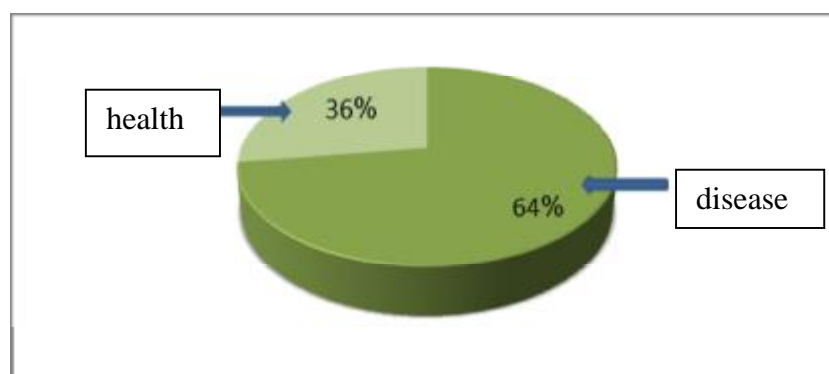


Figure (1): The percentage of healthy and diseased camels

General Examination: Were screening for camels collected blood samples, examination included the following: (the age of the animal - animal type - color - case history in terms of being infected with various diseases, as well as medicines and vaccines used and the method of grazing: Is natural pastures or closed or mixed (natural pastures and concentrated) and places that sponsor them.

Not:- Age estimated by the equation of teeth. Estimated number of permanent teeth are (22) teeth while the not permanent teeth are (34) teeth. At (4) years of age completed the fall of permanent teeth (Al- Ani *et al.*, 1990).

Clinical examination: It was after their own (turbid) camel or she camel and then work on the examination of the mucous membranes of the animal and skin examination to note the wounds and external parasites and skin diseases that case of illness or not so dependent as checking in the future case of the animal disease, to develop treatment plans and improve the wealth Found. Also were examined animals by stethoscope to hear the type of breathing and heartbeat. Temperature was measured using a medical thermometer by measuring the velocity of the rectum and feeling the pulse middle coccygeal artery located at the middle line at the bottom of guilt was also measure the speed of breathing.

Blood samples collection: Medical injection was used that measure (5ml) and needles of measuring (22G) to pull (5ml) of blood volume from the jugular vein after it was their own (turbid) and animal sterilization place drag swab ethyl alcohol. Then put the blood in the fallopian plastic container on the blocker coagulation (EDTA), a salt binary potassium ethylene Secretary tri-acetic acid concentration is 2-1 mg/ml of blood. Directly governs the closing of the bottle is agitated helm and quietly on Figure (8) several times to melt the anticoagulant and blended well with the blood. Then calculated the rate of deposition of red blood cells (ESR) during the first hour of collecting samples of blood by Maachar (Coles, 1986; Schalm, 1986) has been used tubes sedimentation own with holding who is maintenance of the pipe perpendicular to the surface of the table and proven the top and bottom so that they are stable not exposed to any vibration and temperature laboratory fixed then allows the tube to settle the score at the top of the column erythropoiesis during the first hr. (1hr) and during the second hr. (2hrs.) and then during the third hr. (3hrs.) measurement (ESR) (mm/h)

statistical analysis: used the statistical program SPSS in computer.

## Results and discussion

The results of the study, this study for public inspection and clinical examination to the presence of varying degrees of severity symptoms of camel diseased which included (a rise in temperatures, an increase in the speed of the pulse, breathing, general weakness, wasting and varying degrees of pale mucous membranes) the severity of these symptoms was dependent on the type and severity of the disease by an infected animal. Results showed a statistical analysis of temperatures, rapid pulse and breathing as follows: For the temperature there was no statistical difference at the moral level ( $P < 0.01$ ) between camels and she camels, but there was a statistical difference at the moral level ( $P < 0.01$ ) between camels healthy and diseased for the she camels of age (less than a year -2 years) and camel age (6 years - 12 years).

Rates were temperature, rapid pulse and breathing sound in healthy camels respectively (35.8 - 36.6) degrees Celsius 37.5- 44.4 beats/min. Breathing 05/09- 08/13 times/min. As shown in Table 2, and Figure (2).

Table (2) shows the rates of temperature, rapid pulse and breathing sound of camels for both sexes and by age are respectively 35.88-36.63°C and pulse 37.59-44.4 beats/min, respiration 05/09 to 08/13 times/min. Figure (2) shows the rates of temperature, rapid pulse and breathing sound of healthy camels shows that the lower temperature recorded, less pulse and rapid breathing are in she camels age less than a year-2 years were respectively 35.88m 37.59 beats/min, respiration 9.05 times/min. While the highest temperature and the highest respiration was in she camel in age 6 years- 12 years are respectively 36.63 m and 13.08 times/min the highest pulse record in camels in age 6 years-12 years was 44.4 beats/min.

The rates of temperature, rapid pulse and breathing of the patient camels was respectively 36.5-37.3 degrees Celsius 44.7-64.4 beats/min. Breathing 11.8-17 times/min. As shown in Table (3) and Figure (3).

Table(3) shows the rates of temperature, rapid pulse and breathing sound of the patient camels of both sexes by age are respectively (36.52 -37.3) m° pulse 44.72 -64.42 beats/min, respiration 11.8-17 times/min.

Table (2): The rates of temperature, rapid pulse and breathing sound for both sexes of camels by age

Sex	Age/year	No.	statistical	Tem. C	Puls/min	Res./min.
camel	Less than year- 2 year	16	M	36.03	38.76	10.15
			SE±	1.33	0.93	0.53
She camel	Less than year- 2 year	9	M	35.88	37.59	9.05
			SE±	0.2	2.27	1.31
Camel	3year – 5year	12	M	35.97	39.69	10.72
			SE±	0.09	0.93	0.54
She camel	3year – 5year	8	M	36.46	41.53	11.6
			SE±	0.24	1.44	1.38
Camel	6year –12 year	13	M	36.52	44.4	11.81
			SE±	0.28	1.83	1.21
She camel	6year –12 year	6	M	36.63	43.58	13.08
			SE ±	0.35	2.34	1.45

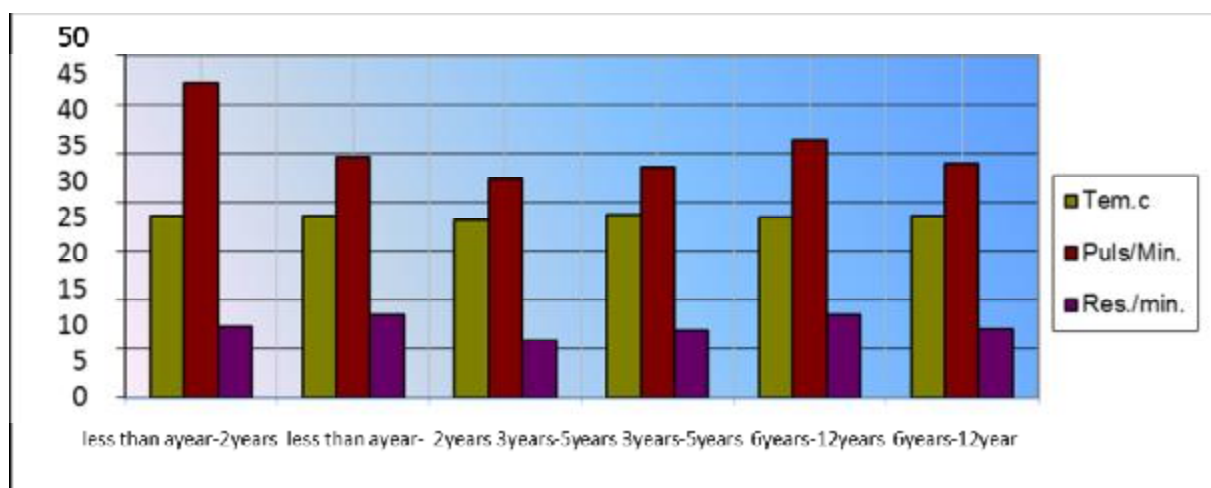


Figure (2): The rates of temperature, rapid pulse and breathing sound for both sexes of camels by age

Table (3): The rates of temperature, rapid pulse and breathing of the patient camels for both sexes by age

Sex	Age/year	No.	statistical	Temp. C	Puls /min	Res./min
Camel	Less than year- 2 year	6	M	37.3	64.42	14.5
			SE±	0.36	2.36	1.29
She camel	Less than year- 2 year	4	M	37.1	49.25	17
			SE±	0.85	3.8	2.73
Camel	3year – 5year	7	M	36.52	44.72	11.8
			SE±	0.26	1.7	1.77
She camel	3year – 5year	5	M	37.05	47.18	13.81
			SE±	0.31	2.39	1.62
Camel	6year –12 year	8	M	36.8	52.75	17
			SE±	0.55	2.94	2.06
She camel	6year –12 year	6	M	37.12	47.97	14.05
			SE±	0.22	1.8.3	1.02

Figure (3) shows the rates of temperature, rapid pulse and breathing for diseased camels shows that the lower temperature and speed of the pulse recorded is 36.52C°, 44.72 beats/min in age of camels 2 years - 5 years, less pulse and rapid breathing recorded in she camels in age (less than a year-2 years was respectively 35.88 m and 37.58 beats/min, respiration 9.05 times/min. The highest temperature and pulse was in camels of age (less than a year - 2 years) are respectively 37.3m, 64.42 beats/min while the highest speed respiration is 17 times/min was in camels of age 6 years - 12 years and in she camels in age less than a year - 2 years.

Results of the examination rate of deposition Red blood cells (ESR) the average precipitation of the red blood cells healthy camels in the first hr. (0.33-1.08) mm/hr. and the second hour 1.23-2.3 mm/hr., and the third hr. 2.66 - 3.40 mm/hr. In diseased camels, bringing the rate of deposition of the red blood cells in the first hr. 3.7 -5.0 mm/hr. and in the second hr. 6.9-13.49 mm/hr. and in the third hr. 7.75-19.09 mm/hr.

The results also showed that there was no statistical difference significant (0.05 <p) between

beauty and camel, as shown in Table (4) and Figure (4), which shows the rates of deposition blood cells Rouge camels sound by age and sex measured in mm/hr.

Table (4) shows the rate of sedimentation of the red blood cells in camels during the first hour 0.33 - 1.08 mm/hr., the second hr. 1.23 - 2.3 mm/hr., and the third hr. 2.66 - 3.40 mm/hr.

Figure (4) shows the rate of deposition of blood cells Red in healthy Camels shows that the lowest value recorded 0.33 mm/hr. during the first hour in she camels in age 6 years - 12 years. The highest value recorded was 3.40 mm/hr. during the third hours in she camels in age less than a year-2 years.

Table (5) shows the rate of deposition of the red blood cells of the patient camels during the first hour 3.75 -5 mm/hr., the second hr. 7.62 -13.49 mm/hr., and the third hr. 7.75 -19.09 mm/hr. Figure (5) shows the rate of deposition of blood cells in patient camels, the lowest value recorded 3.75 mm/hr. during the first hr. in the camel in age (less than a year -2 years). The highest value recorded was 19.09 mm/hr. in the third hr. in she camels in age 6 years - 12 years.

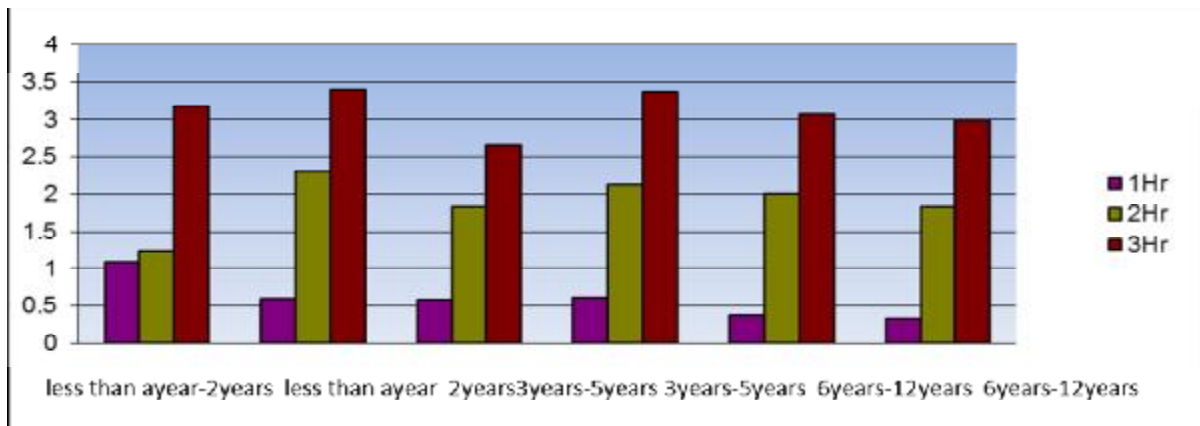


Figure (3): The rates of temperature, rapid pulse and breathing of the patient camels for both sexes by age

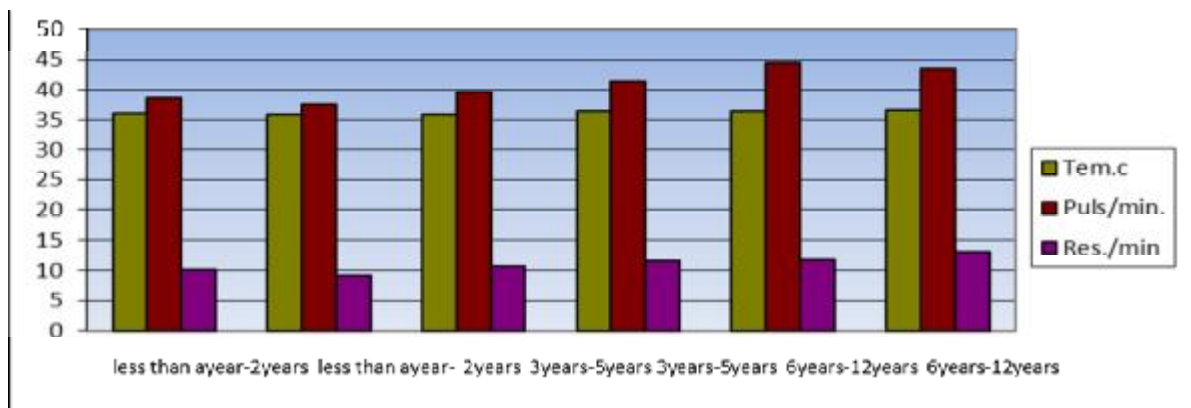


Figure (4): The rates of deposition of the red blood cells with time measured in mm / h in camels for both sexes by age

Table (4): The rates of deposition of the red blood cells with time measured in mm/hr. in camels for both sexes by age.

Sex	Age/year	No.	statistical	Hr 1	2Hrs	3Hrs
Camel	Less than year- 2 year	16	M	1.08	1.23	3.18
			SE±	0.4	0.3	0.93
She camel	Less than year- 2 year	9	M	0.6	2.3	3.40
			SE±	0.1	0.9	0.96
Camel	3year – 5year	12	M	0.58	1.83	2.66
			SE±	0.15	0.7	0.91
She camel	3year – 5year	8	M	0.62	2.12	3.37
			SE±	0.19	0.89	0.3
Camel	6year –12 year	13	M	0.38	2	3.07
			SE±	0.2	0.92	0.2
She camel	6year –12 year	6	M	0.33	1.83	3
			SE ±	0.08	0.97	0.19

Table (5): The rates of deposition of the red blood cells with time measured in mm/hr. in the patient camels for both sexes

sex	Age/year	No.	statistical	1 Hr	Hrs 2	Hrs 3
camel	Less than year- 2 year	6	M	4.33	9.33	15
			SE±	0.4	1.7	2.9
She camel	Less than year- 2 year	4	M	3.75	6.9	7.75
			SE±	0.25	1.9	3.5
camel	3year – 5year	7	M	4.14	9.85	17.14
			SE±	0.2	1.6	0.3
She camel	3year – 5year	5	M	4.2	11	16.8
			SE±	0.19	2.4	1.5
camel	6year –12 year	8	M	3.98	7.62	13.75
			SE±	1.4	2.7	2.85
She camel	6year –12 year	6	M	5	13.49	19.09
			SE ±	1.6	1.2	1.6

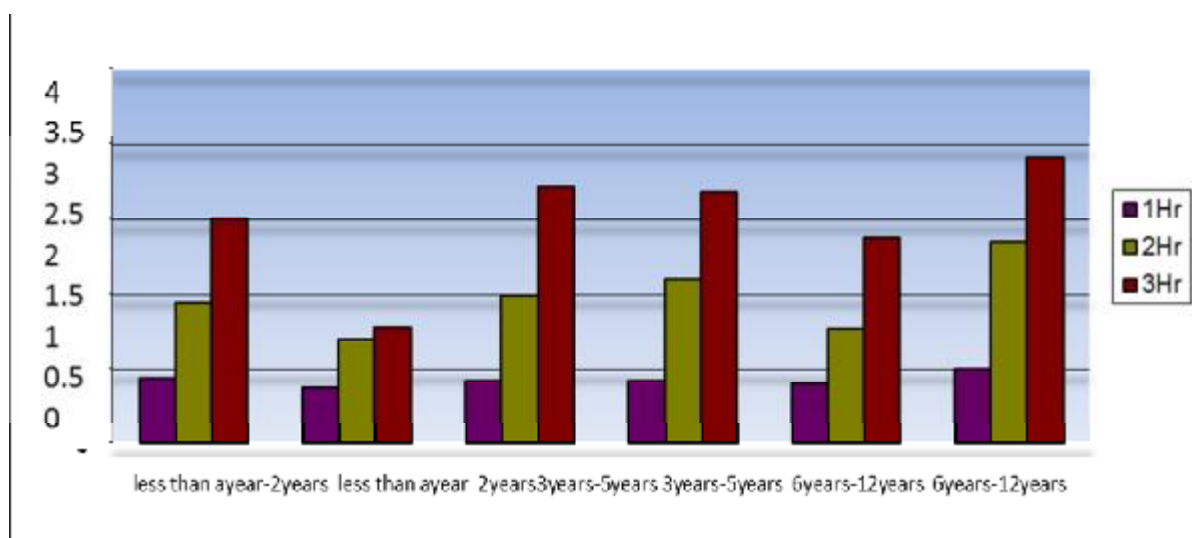


Figure (5): The rates of deposition of the red blood cells with time measured in mm/hr. in patient camels for both sexes



The results showed the statistical least significant difference (LSD) have (2.1) and the statistical results show that the presence of a significant level of statistical difference ( $P < 0.05$ ) between the values in healthy and diseased camels, the most in three hours and in all samples for she camels and camels.

The results of this study for public inspection and clinical examination to the presence of varying degrees of severity symptoms in diseased camels which included (a rise in temperatures and an increase in the speed of the pulse and breathing - general weakness - wasting - and varying degrees of pale mucous membranes) the severity of these symptoms depends on the type of severity of the disease by an infected animal pointed out (Bradford, 2002; Radostitis, *et al.*, 2002). showed the results of the statistical analysis of temperatures, rapid pulse and breathing as follows:

For the temperature there was no statistical difference moral level ( $P < 0.01$ ) between camels and she camels, but there was a statistical difference moral level ( $P < 0.01$ ) between camels healthy and diseased for the she camels in age (less than a year - 2 years) and camels in age (5 years-12 years). Rates were temperature, rapid pulse and breathing sound in healthy camels respectively 35.8-36.6 degrees Celsius 37.5-44.4 beats/min, respiration (05/09 to 08/13) times/min. This is consistent with (Al- Ani *et al.*, 1990; Al- Janabi *et al.*, 1990).

The rates of temperature, rapid pulse and breathing in diseased camels are respectively 36.5 - 37.3 m° pulse 44.7 -64.4 beats/min, respiration (11.8 -17) times / min and thus we note the high rates in the camel sick than it is in the camel sound this is consistent with Maachar to each of (Al- Ani *et al.*, 1990; Coles, 1986; Schalm, 1986; Bradford, 2002; Radostitis *et al.*, 2002).

The results of the statistical analysis of the rate of sedimentation of blood cells Rouge no difference statistically significant ( $P < 0.05$ ) between camels and she camels, but no difference statistically significant level ( $P < 0.05$ ) between the values of ESR for healthy camels and diseased and in all samples in the camels and the she camels, the most in (three hours). The rate of deposition of the red blood cells is affected, including: The number of red blood cells per unit volume of blood, If camels thirst or drinking water, Shaped red blood corpuscle and the presence of electric charges on the surface of blood corpuscle (Coles, 1986; Schalm, 1986; Mahmoud *et al.*, 1988).

The results of the statistical analysis of statistical analysis of the rate of deposition of red blood cells in three hours interpreted as due to changes in the rise in three hrs. in all ages and both

sexes, without exception, in the camel sick. The results of the different electric charges negative on the surface of red blood cells, which relate to changes positive charges of the plasma, which leads to changes physical and chemical potential to get on the surface of red blood cells in the case of illness that cause inflammatory of tissue ,necrosis and crashed and leads to the red blood cells collect then increase the rate of deposition of the red blood cells. As pointed out by (Al- Ani *et al.*, 1990; Coles, 1986; Schalm, 1986).

As for the high value (ESR) for small ages less than a year -2 years for both sexes explains most likely due to diseases of inflammation such as contagious respiratory emerged as many cases of pneumonia, pleurisy and bronchitis. Bacterial inflammation lead to a lack in the number of red blood cells and thus to increase (ESR) as pointed out (Al- Ani *et al.*, 1990; Yagil, 1985; El-magawry *et al.*, 1986; Momin *et al.*, 1987; Al-Sharifi, 1990) as for camels in age (2 years -5 years (in addition to that she was infected with inflammatory disease were infected with infectious parasites has indicated (Coles, 1986; Benjamin, 1986) to the infestation of infectious except (Haimonkus) leads to anemia and this in turn leads to an increase (ESR).

The camels in age 5 years - 12 years sick they were suffering from inflammatory diseases and some of them suffering from disease (trypanosomiasis) the incidence of this disease leads to the decomposition of red blood cells and anemia as a result of the presence of the parasite (*T. evansi*), which affects the bone marrow and then lead to a crash where the red blood cells that the parasite contains material responsible for the decomposition of red blood cells as pointed out by (Davilia and Silva, 2000; Singh and Mistra, 1986; Harter *et al.*, 1985) this decomposition in red blood cells leads to anemia and low number of blood cells, which leads to the result of increase the value of (ESR).

## Conclusions

The rate of deposition of red blood cells increase in cases of diseased camels and at least in the very state of health, We must perform many other studies on the blood of camels for lack in Arabic library for such research to increase a deepen the field studies related to camels and must be supported by various means to make it a success. Must pay more attention to camels and so form a group in the Ministry of Agriculture calling for the development of camels and camel breeders help to support financially and morally to facilitate their mission and encourage them to invest economic camels. Also provide opportunities for

intensive scientific meetings and conferences and seminars regularly to exchange experiences and opinions between specialists and technicians and educators engage in it.

### References

- ACSAD, 2002. Network research and development of the camel. Arab Center for the Studies of Arid Zones and arid lands. Cardin / ACSAD / Apple / n 100. Pp. 70. ACSAD,1980, the camel in the Arab world. League of Arab States.
- Al-Ani, F.K. Al-Abbasi, S.N. and Al-Rubaie, A. 1990. Camel breeding and diseases. Ministry of Higher Education and Scientific Research, University of Baghdad, Dar Al Hekma printing. Printing & Publishing, Baghdad. 5-7pp.
- Al-Janabi. A.S. Al-Galile, Z.F. 1990. Camels Characteristics and physiology. Ministry of Higher Education and Scientific Research, Baghdad University, Higher Education Press, Mosul. 4-10pp.
- Al-Sharifi, M.R. 1990. Master Thesis, College of Veterinary Medicine, Internal Medicine and Preventive Veterinary, Baghdad, Iraq.
- Benjamin, M.M. 1986. outline of veterinary clinical pathology. 3<sup>rd</sup> ed., 203-206pp.
- Bradford, P.S. 2002. Largeanimal Internal Medicine, 3<sup>rd</sup> ed., Mosby. 533pp.
- Coles, E.H. 1986. Veterinary Clinical Pathology. 4<sup>th</sup> ed., Sanders Co. Philadelphia.
- Davilia, A.M.R. and Silva, R.A.M. 2000. Animal trypanosomiasis in south America: Current status, partnership and information technology. Annals of the Network Academy of Sciences. News, 2(4): 1-2.
- El-Magawry, S.J.; Okela, M.; Izzat, M. and El-Ahar, H.M. 1986. Etiological study on respiratory affection in camels and its relation to hematological and biochemical changes. Asuit Vet. Med. J., 17: 97 -103.
- Harter, G.H.; Roltcher, D.; Schillinger, D.M. and zwey, E. 1985. Experimental infection in camel (*Camelus dromedarius*). Vet. Bull. 56(1): 30.
- Mahmoud, G.S.; Al- Darraji, A.M.; Khalid, F.H.; Al-Saadi, H.I.; Al-Izzi, S.A. and Gitan, R.S. 1988 Veterinary Clinical Pathology. Part I and II (12-48) and (16-94).
- Momin, R.R.; Pethkar, D.K.; Jaiswal, T.N. and Jahala, V.W. 1987. An outbreak of pasteurelosis in camels. Indian Vet. J., 64:863-873.
- Radostitis, O.M.; Gay, C.C.; Blood, D.C. and Hinchcliff, K.W. 2002. Veterinary Medicine. 10<sup>th</sup> ed., W.B. Saunders .P.P( 55-60 ),(390-405) ,(705),(1032-1050) (1562-1714) .
- Sciences and Technology, 2004. Scientific journal published quarterly King Abdul Aziz City for Science and Technology. Year 18. No. 70. Hereafter spring 1425 AH / May p: (17-23).
- Schalm, O.W.; Sain, N.C. and Carroll, E.J. 1986. Veterinary Haematology. 4<sup>th</sup> ed., Philadelphia. pp (16 48,66-68,164-188,321,409-411) .
- Singh, B. and Mistra, S.K. 1986. Hematological changes in *Trypanosoms evansi* infection in calves . India J. Vet. Med., 6(2): 108-109.
- Warda. M.F. 1989. Arab camels, origins, strains and methods of breeding. The first edition. Dar Al-Malah for printing and publishing. 14-16pp.
- Yagil, R. 1985. The desert camel, comparative physiological adaptation krayer, Basel, Witzerlamal Yagil, R., 1982. FAO Animal production & heath paper No.26.camels and camel milk ,p.41 . Rome: Food and Agriculture organization of the U.N (Higgins, 1985).