رقم البحث (62)

FIELD STUDIES FOR THE EFFECTS OF POLYCRESOLSPRAY (METROGEN®) ON SOME REPRODUCTIVE PERFORMANCES IN CATTLE AND BUFFALOES IN EGYPT

BY

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ABSTRACT

The present study was delineated to work over the possible effects of polycresol spray on the fertility performance in cattle and buffaloes after retained fetal membranes, uterine prolapse and open pyometra. In this trial 50 cows on 3 dairy farms on Dakahlia and Alexandria governorates and 40 female buffaloes on DakahliaGovernorate at October 2012 until May 2013 were used. After a clinical, vaginal and rectal examinations of cows and buffaloes. 40 cows displayed retained fetal membranes and 10 cows suffered from open pyometra. While 20 female buffaloes displayed uterine prolapse and other 20 reflected open pyometra.

Cows with retained fetal membranes and buffaloes with uterine prolapse were treated by once intrauterine administration of polycresol spray 8 mg/ Animal. All cases of open pyometra were treated with intrauterine administration of 4 mg/ Animal. Seven cows and 6 buffaloes of open pyometra received single administration of 4 mg/ Animal, 3 cows and 10 buffaloes received the second dose three days post the first one while 4 buffaloes received the third dose three days post the second one. Thirty uterine swabs from open pyometra (10 cows and 20 buffaloes) were taken and sent to Animal Reproduction Research Institute – Al-Harem Street- Giza Governorate- Egypt for bacteriological isolation of the causative agents for pyometra.

Our study revealed that 25 (62.5%) animals of retained fetal membranes displayed 60-90 days for first estrus cycle (Days open) post the intrauterine administration of Polycresol these animals were rectally examined two months after insemination and mirrored a pregnancy moreover no culling or repeat breeder recorded within these animals.Seven animals (17.5%) entered to the first estrus (Days open) after 120- 160 days that animal mirrored a repeat breeder for one time and responded to treatment by intrauterine administration of Penicillin G sodium (300000IU) + Streptomycin (1 gm.) dissolved 60 cc distilled water and there was no culling recorded on these animals. Other five animals (12.5%) displayed the same results except the days for first estrous were 180—200 days. On the other hand three cows (7.5%) revealed more than 200 days for the first estrous (Days open) and reflected more than cycles (repeat breeder) that not responded to the previous antibacterial therapy finally these animals were culled as a result of pregnancy failure.

The present study revealed that 14 uterine prolapse treated buffalo females (70%) displayed 45- 90 days for first estrus cycle (Days open) post the intrauterine administration of Polycresol these animals were rectally examined two months after insemination and mirrored a pregnancy moreover no culling or repeat breeder recorded within these animals. Moreover, 4 animals (20 %) showed the first estrus (Days open) after 120- 150 days that animal mirrored a repeat breeder for one time and responded to treatment by intrauterine administration of Penicillin G sodium (300000IU) + Streptomycin (1 gm.) dissolved 60 cc distilled water and there was no culling recorded on these animals.On the other hand our data revealed that two treated females (10%) mirrored more than 200 days for the first estrous (Days open) and reflected more than cycles (repeat breeder) that not responded to the previous antibacterial therapy finally these animals were culled as a result of pregnancy failure.

Our results proved that a single intrauterine administration of polycresolspray in case of open pyometraevoked complete treatment of uterine infection on 5 cows (50%) and 5 buffalo females (25%). Meanwhile, 3 cows (30%) and 9 buffalo females (45%) treated by double dose these animals were rectally examined two months after insemination and mirrored a pregnancy moreover no culling or repeat breeder recorded within these animals. Wherever, two cows and six buffalo females administered triple doses and the 4 buffalo females (20%) were responded for treatment while other two cows (20%) and two buffalo females (10%) were not treated and then culled.

The bacteriological examination of uterine discharge of animals before treatment with polycresol spray (4 mg/ Animal) showed that Escherichia (E.) coli was isolated from 4 cows (40%) and 9 buffalo females (45%), Staphylococcus species was 2 cows (20%) and 4 buffalo females (20%), streptococcus species was one cow (10%) and two buffalo females (10%) and Arcanobacteriumpyogenes was three cows (30%) and five buffalo females (35%).Moreover, our data reflected that the E.Coli infected animals were responded to the polycresol spray mirrored as three cows and seven buffalo females were rectally examined two months after insemination and mirrored a pregnancy in a percent (75 and 77.78, respectively) while all staphylococcus and streptococcus infected animals were responded to polycresol treatment and animals infected with Arcanobacteriumpyogenes were responded to treatment except one cow that culled and reflected a fertility percent (66.67 and 100 % in cows and buffalo respectively)

INTRODUCTION

Uterus is one of the main conditions which determine reproduction performances. Between factors which affect health or disorders of uterus in post partial period exists very complicated connection. Early insight of problematic cows enables faster and more efficient intervention.Optimum fertility potential is necessary in animals for economic dairy entrepreneurship. Infection of genital organs is an important cause of impaired fertility. Low-grade endometritis due to infections and secondary inflammations constitute major uterine pathology. Additionally, uterine affections like placental retention, pyometra are clinically important. Prompt therapeutic regime and attention towards hygienic husbandry practices helps to restore fertility**(Kasimanickam et al, 2002).**

A variety of agents,antiseptic or other- wise,have been infused into the uterus in an attempt to destroy bacteria,enhance uterine defense mechanisms, or increase uterine tone and blood flow**(Risco and Hernandez 2003)**.

Cresols are organic compounds which are methylphenols. They are a widely occurring natural and manufactured group of aromatic organic compounds, which are categorized as phenols (sometimes called phenolics). Depending on the temperature, cresols can be solid or liquid because they have melting points not far from room temperature. Like other types of

phenols, they are slowly oxidized by long exposure to air and the impurities often give cresols a yellowish to brownish red tint**(Crocella, et. al. 2010)**.

The present study was delineated to work over the possible effects of polycresol spray on the fertility performance in cattle and buffaloes after retained fetal membranes, uterine prolapse and open pyometra.

MATERIALS AND METHODS

Drug:

Polycresolspray (**Metrogen**®): 20 cc solution each cc containing 400µg of polycresol in the form of sprayer produced by Provet Company. Turkey.

Animals used:

In these trial 50 cows on 3 dairy farms on Dakahlia and Alexandria governorates and40 female buffaloes on DakahliaGovernorate atOctober2012 until May2013were used. After a clinical, vaginal and rectal examinations of cows and buffaloes. 40 cows displayed retained fetal membranes and 10 cows suffered from open pyometra. While 20 female buffaloes displayed uterine prolapse and other 20 reflected open pyometra.

Cows with retained fetal membranes and buffaloes with uterine prolapse were treated by once intrauterine administration of polycresol spray 8mg/Animal. All cases of open pyometra were treated with intrauterine administration of 4 mg/ Animal. Seven cows and 6 buffaloes of open pyometra received single administration of 4 mg/ Animal, 3 cows and 10 buffaloes received the second dose three days post the first one while 4 buffaloesreceived the third dose three days post the second one.

Sampling:

Thirty uterine swabs from open pyometra (10 cows and 20 buffaloes) were taken and sent to Animal Reproduction Research Institute – Al-Harem Street- Giza Governorate- Egypt for bacteriological isolation of the causative agents for pyometra.

Bacteriological Examination:

E.Coli: according to**Songer and Post (2005)**.

Staphylococcus species: according to **Songer and Post (2005)**.

Streptococcus species: according to **Songer and Post (2005)**.

Arcanobacteriumpyogenes: accordingto**Cowans and Steel (1993).**

RESULTS AND DISCUSSION

The effect of polycresol spray (8 mg/ Animal) on some reproduction performances of 40 cows displayed retained fetal membranes

Our study revealed that 25 (62.5%) animals displayed 60- 90 daysfor first estrus cycle (Days open) post the intrauterine administration of Polycresolthese animals were rectally examined two months after insemination and mirrored a pregnancy moreover no culling or repeat breeder recorded within these animals (Table: 1). The occurrence of metritis, endometritis and subsequently pyometra has been associated with abnormal parturitions including dystocia, retained placenta and abortion **(Roberts. 1971).**Keeping with the same line Polycreasol after intrauterine administration at a dose 8 mg/ Animal inhibit pathogenic microorganism in 62.5% of experimented cows with retained fetal membranes.

Different studies suggested that Retained fetal membranes reduced preg- nancy rate among dairy cows by 40% **(Erb et al., 1958),** but comparable information on beef cattle is lacking. The incidence of retained placenta among beef cattle ranges from 5.5 to 11.7%, with the frequency two to three times greater in cases involving calving difficulty or stillbirth**(Wetherill, 1965 andPhilipsson, 1976)**. By matching of our results by these studies we can concluded that polycresol increase the fertility performances on treated dams.

Retained placenta remains therapeutic challenge in cattle. Certain traditional medicines are believed to be able to alleviate retained placenta condition and improve overall fertility in cows. The study by **Cui, et al (2013 and 2014)**was designed to evaluate the efficacy of an herbal tincture for treatment of retained placenta. They suggested that Herbal tincture used in there study might facilitate expulsion of retained placenta and improve subsequent fertility, thus could present effective treatment option for retained placenta in cows.Given this framework, it is conceivable to explain the effect of polycreasol on the fertility profile of 62.5 % of treated animals.

Seven animals(17.5%) entered to the first estrus (Days open) after 120- 160days that animal mirrored a repeat breeder for one time and responded to treatment by intrauterine administration of Penicillin G sodium (300000IU) + Streptomycin (1 gm.) dissolved 60 cc distilled water and there was no culling recorded on these animals. Other five animals (12.5%) displayed the same results except the days for first estrous were 180—200 days (Table: 1).There is now evidence that antimicrobial treatment to be successful, an effective concentration of drug must be achieved and maintained at the site of infection for an adequate period. Several antimicrobial agents are absorbed from the uterus (tetracycline, penicillin, ampicillin and gentamicin)**(Dohmen et al. 1995)**.

Endometritis induces direct uterine effects that may impair fertility. Prostaglandins of the D-series might be involved in maternal recognition of pregnancy and embryo attachment, and the expression of genes associated with their production may be affected by uterine inflammation **(Gabler et al. 2009).**On similar ground Penicillin G sodium (300000IU) + Streptomycin (1gm.) combination was used on these studyfor treatment of intrauterine infection (Table: 1).

On the other hand three cows (7.5%) revealed more than 200 days for the first estrous (Days open) and reflected more than cycles (repeat breeder) that not responded to the previous antibacterial therapy finally these animals were culled as a result of pregnancy failure (Table: 1).

The effect of polycresol spray (8 mg/ Animal) on some reproduction performances of 20female buffaloes displayed uterine prolapse.

The present study revealed that 14 treated buffalo females (70%) displayed 45- 90 days for first estrus cycle (Days open) post the intrauterine administration of Polycresol these animals were rectally examined two months after insemination and mirrored a pregnancy moreover no culling or repeat breeder recorded within these animals (Table: 2). Moreover, 4 animals (20 %) showed the first estrus (Days open) after 120- 150 days that animal mirrored a repeat breeder for one time and responded to treatment by intrauterine administration of Penicillin G sodium (300000IU) + Streptomycin (1 gm.) dissolved 60 cc distilled water and there was no culling recorded on these animals(Table: 2).

Waldner (2013) suggested that the adverse calving-associated events such as severe dystocia, problems such as uterine prolapse or retained placentas, abortion or calf death within 1 hour of birth were also associated with an increased risk of abortion the subsequent calving season after accounting for all other factors.Theelder studies reported incidence of prolapse of the reproductive tract in beef cattle ranges from 1 to 2% **(Woodward and Quesenberry, 1956)** where at this time the published data regarding subsequent fertility of dams that experience prolapse are not available. Recently, **(Patterson, et. al . 1981)** recorded that the pregnancy rates following prolapse among primiparous and multiparous dams were 28.0 and 57.9%, respectively. These data indicate that caesarean section and vaginal or uterine prolapse result in significant reductions in subsequent pregnancy rates of affected dams. Our obtained data reflected that the intrauterine administration of polycresol (8 mg/animal) improved the fertility performance to 90% (70% was recorded on pregnancy after first insemination where 20% was mirrored repeat breeder for one cycle and responded to treatment).

Moreover, (**Jubb, et. Al. 1990)** observed that cows with uterine prolapse have a good chance of surviving if treated, that treatment is cost-effective, that uterine prolapse is unlikely to reoccur and treated cows have a good chance of conceiving. The present data showed a good conceiving on treated buffalo females.

On the other hand our data revealed that twotreatedfemales (10%) mirrored more than 200 days for the first estrous (Days open) and reflected more than cycles (repeat breeder) that not responded to the previous antibacterial therapy finally these animals were culled as a result of pregnancy failure (Table: 2).

The effect of polycresol spray (4 mg/ Animal) on some reproduction performances of10 cow and 20female buffaloes displayed open pyometra.

Our results proved that a single intrauterine administration of polycresolevokedcomplete treatment of uterine infection on 5 cows (50%) and 5buffalo females (25%). Meanwhile, 3 cows (30%) and 9 buffalo females (45%) treated by double dose these animals were rectally examined two months after insemination and mirrored a pregnancy moreover no culling or repeat breeder recorded within these animals (Table: 3).

Wherever, two cows and six buffalo females administered triple doses and the 4 buffalo females (20%) were responded for treatment while other two cows (20%) and two buffalo females (10%) were not treated and then culled(Table: 3).

The infection and to some extent the inflammation of the uterine wall during and after parturition must be accepted as a physiological process **(Lewis, 1997)**. Pathogenic species for metritis isolated from the uterine cavity are Escherichia (E.) coli, Arcanobacterium (A.) pyogenes, and obligate anaerobic species Fusobacterium (F.) necrophorum and Prevotella spp. **(Sheldon, et. al. 2004)**. Beside the quantity and quality of bacteria in the uterus, the efficiency of uterine defense mechanisms determines the severity of metritis. The uterine defense mechanisms consist of anatomical and physical barriers, i.e. the vulvar and cervical closure as well as the cell-mediated and humoral immune systems. The initial cellular response to an infection of the uterine wall is an influx of polymorphonuclear leukocytes and macrophages. Immunoglobulins and opsonins are released from the endometrium **(Bondurant 1999 and Dhaliwal, et. al. 2001)**.

The bacteriological examination of uterine discharge of animals before treatment with polycresolspray (4 mg/ Animal) showed that Escherichia (E.) coli was isolated from 4 cows (40%) and 9buffalo females (45%), Staphylococcus species was 2 cows (20%) and 4buffalo females (20%), streptococcus species was one cow (10%) and twobuffalo females (10%) and Arcanobacteriumpyogenes was three cows (30%) and fivebuffalo females (35%) (Table: 4).

The most prevalent bacteria in uterine lumen were Escherichia coli, Arcanobacteriumpyogenes, Staphylococcus aureus, and Fusobacteriumnecrophorum (18.5, 16.7, 13.0, and 9.3%, respectively). High levels of polymorphonuclear cells were observed in buffalo infected with A. pyogenes and gram-negative anaerobic bacteria (62.1 and 76.4%). A high prevalence of gram-negative anaerobes was isolated from uteri harboring A. pyogenes (13.0%) **(Azawi, et. al. 2007)**.

Moreover, our data reflected that the E.Coli infected animals were responded to the polycresol spray mirrored as three cows and seven buffalo females were rectally examined two months after insemination and mirrored a pregnancy in a percent (75 and 77.78, respectively) while all staphylococcus and streptococcus infected animals were responded to polycresol treatment and animals infected with Arcanobacteriumpyogenes were responded to treatment except one cow that culled and reflected a fertility percent (66.67 and 100 % in cows and buffalo respectively) (Table: 4).

Table (1): The effect of once intrauterine administration of polycresol spray 8 mg/Animalon some reproduction performances of 40 cows displayed retained fetal membranes

No of animal	Days open (1st estrus)	Pregnancy Two months post insemination	Culling	Repeat breeder	Other therapy	%
25	60- 90	+	-	-	-	62.5
7	120-160	+	-	+	Penicillin + Streptomycin*	17.5
5	180- 200	+	-	+	Penicillin + Streptomycin*	12.5
3	>200	-	+	+	Penicillin + Streptomycin*	7.5

* Penicillin G sodium (300000IU) + Streptomycin (1 gm) dissolved 60 cc distilled water intrauterine administered

Table (2): The effect of once intrauterine administration of polycresol spray 8 mg/ Animal on some reproduction performances of20 female buffaloes displayed uterine prolapse.

No of animal	Days open (1st estrus)	Pregnancy Two months post insemination	Culling	Repeat breeder	Other therapy	%
14	45- 90	+	-	-	-	70%
4	120-150	+	-	+	Penicillin + Streptomycin*	20%
2	>200	-	+	+	Penicillin + Streptomycin*	10%

* Penicillin G sodium (300000IU) + Streptomycin (1 gm) disolvedin 60 cc distilled water intrauterine administered

Table (3): The effect of intrauterine administration of polycresol spray 4 mg/ Animal on some reproduction performances of 10 cows and 20 female buffaloes displayed open pyometra.

No of animal		No. of drug doses	Pregnancy Two months post insemination		Culling		Other therapy	%	
Cow	*Buffalo*		*Cow*	*Buffalo*	*Cow*	*Buffalo*		*Cow*	*Buffalo*
5	5	Single	+	+	-	-	-	50	25
3	9	Double	+	+		-	-	30	45
2	6	Triple	-	4	2	2	Penicillin + Streptomycin*	20 Culled	20 Concep 10 Culled

* Penicillin G sodium (300000IU) + Streptomycin (1 gm) disolvedin 60 cc distilled water intrauterine administered post the third dose of polycresol .

Table (4): The bacteriological examination of uterine discharges of 10 cows and 20 female buffaloes displayed open pyometra before and after of intrauterine administration of polycresol spray 4 mg/ Animal.

Bacteriological isolate	No of animal		Infection%		Pregnancy Two months post insemination		Culling		Fertility%	
	Cow	Buffalo	Cow	Buffalo	Cow	Buffalo	Cow	Buffalo	Cow	Buffalo
Coliform	**4**	**9**	**40**	**45**	**3**	**7**	**1**	**2**	**75**	**77.78**
Staphylococcus	**2**	**4**	**20**	**20**	**2**	**4**	**0**	**0**	**100**	**100**
Streptococcus	**1**	**2**	**10**	**10**	**1**	**2**	**0**	**0**	**100**	**100**
A.pyogen	**3**	**5**	**30**	**35**	**2**	**5**	**1**	**0**	**66.67**	**100**

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الملخص العربى

دراسات حقلية لتأثيرات البولى كيرزول (المتروجين) على بعض الظواهر الانجابية فى الابقار والجاموس فى مصر

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وقد اجريت هذه الدراسة للوقوف على الآثار المحتملة لدواء البولى كيرزول على أداء الخصوبة في الماشية والجاموس بعد احتباس الأغشية الجنينيه، وخروج الرحم والتهاب الرحم وقد تم استخدام ٥٠ بقرة في ٣ مزارع لألبان في محافظتى الدقهلية والإسكندرية و٤٠ من اناث الجاموس فى محافظة الدقهلية وذلك في الفترة من أكتوبر ٢٠١٢ حتى مايو ٢٠١٣. وبعد الفحص من خلال كل من والمستقيم فى الأبقار والجاموس فقد وجد أن ٤٠ من الأبقار تعانى من احتباس الأغشية الجنينيه و١٠ الأبقار يعاني من التهاب الرحم المفتوح في حين أن ٢٠ من اناث الجاموس أظهرتخروج الرحم فى حين أن ٢٠ أخرى تعانى من التهاب الرحم المفتوح.تم علاج كل الأبقار والجاموس التى تعانى من احتباس الأغشية الجنينيه وكذلك خروج الرحم وذلك بوضع رذاذ البولى كيرزول ٨ ملجم لكل حيوان داخل الرحم وكذلك تم علاج جميع حالات التهاب الرحم المفتوح بجرع ٤ ملجم لكل حيوان داخل الرحم. فى حين أن سبع بقرات و ٦ من أناث الجاموس التى تعانى من التهاب الرحم المفتوح قد عولجت بجرعة ٤ ملجملكل حيوان داخل الرحم فى حين أنثلاثة من الأبقار و١٠ من الجاموس قد تلقت جرعة ثانية بعد ثلاثة أيام من الجرعةالأولى بينما تلقت ٤ من الجاموس الجرعة الثالثة بعد ثلاثة أيام من الجرعة الثانية. وقد تم أخذ مسحات من ثلاثين رأس تعانى من التهاب الرحمالمفتوح (١٠ أبقار و٢٠من اناث الجاموس) وذلك لعزل البكتريا المسببه لالتهاب الرحم المفتوح.

لقد كشفت الدراسة أن ٢٥من الحيوانات التى تعانى من احتباس الأغشية الجنينية المعالجة اى بنسبة (٦٢,٥٪) من اجمالى الحيوانات التى تعانى من احتباس الأغشية الجنينة قد اظهرت اول دورة شبق بعد ٦٠-٩٠ يوما من العلاج وكذلك تم فحص هذه الحيوانات عن طريق المستقيم بعد شهرين من التلقيح وذلك لفحص الحمل وقد تبيين أن كل الحيوانات قد دخلت فى الحمل وعلاوة على ذلك لا يوجد استبعاد لأى حيوان من القطيع فى حين أن سبعة حيوانات بنسبة (١٧,٥٪) قد دخلتفىالشبق بعد ١٢٠-١٦٠ يوما هذه الحيوانات قد بينت تكرار فى السياع وقد عولجت بوضع البنسلين G الصوديوم (٣٠٠٠٠٠وحده) + الستربتوميسين (١ جم) فى٦٠ سم مكعب من الماء المقطر ووضعها بعد ذلك داخل الرحم ولم ستبعد اى منها من القطيع. أما الخمسحيواناتالأخرى بنسبة (١٢,٥٪) قد جاءت فى اول دورة شبق عند ١٨٠-٢٠٠ يوما فى حين ان ثلاث بقرات (٧,٥٪) جاءت فى الشبق بعد أكثر من ٢٠٠ يوم وكذلك اظهرت التي لم تستجب للعلاج بالمضاداتالحيوية السابقةوتم استبعادها من القطيع.

وكذلك بينت الدراسة أن ١٤ من اناث الجاموس بنسبة (٧٠٪) من التى تعانى من خروج الرحم قد دخلت فى اول دورة شبق عند ٤٥-٩٠ من العلاج وعند فحص هذه الحيوانات عن طريق المستقيم بعد شهرين من التلقيح تبين أن جميع الحيوانت قد دخلت فى الحمل وعلاوة على ذلك لا يوجد استبعادات او تكرار لدورات الشياع قد سجلت ضمن هذه الحيواناتفى حين أن ٤ حيوانات بنسبة (٢٠٪) جاءت فى الشبق عند بعد ١٢٠-١٥٠ يوما قد اظهرت تكرار الشياع وقد تم العلاج بكل من البنسلين G صوديوم والاستربتومايسين كما ذكر سابقا وليس هناك أستبعادات أن اثنين من الإناث المعالجة (١٠٪) دخلت فى الشياعبعد ٢٠٠ يوم وقد عولجت من تكرار الشياع حيث لم تستجب للعلاج وتم أستبعاد هذه الحيوانات نتيجة لفشل الحمل.

أثبتت نتائجنا أن استخدام البولى كيرزول في حالة التهاب الرحم المفتوح قد اظهر شفاء من ٥ الأبقار (٥٠٪) و ٥ إناث الجاموس (٢٥٪). وفي الوقت نفسه، ٣ أبقار (٣٠٪) و ٩ إناث الجاموس (٤٥٪) قد أخذت عدد اثنين جرعه وقد تم فحص هذه الحيوانات بعد شهرين ىمن التلقيح وثبت الحمل وعلاوة على ذلك لا يوجد استبعاد أو تكرار الشياع سجلت ضمن هذه الحيوانات. وتم تكرار الشياع فى بقرتين وستة إناث الجاموس وقد استجابة لجرعة الثلاثية من المضادات الحيويةوقد تم استبعاد بقرتين منهم بنسبة (٢٠٪) واثنين من اناث الجاموس (١٠٪).

وأظهر الفحص البكتريولوجي للعينات المأخوذة من الحيوانات قبل العلاج بالبولى كيرزول ٤ ملجملكلحيوان أن الميكروب القولونى تم عزلة ٤ من الأبقار (٤٠٪) و ٩ إناث من الجاموس (٤٥٪)، وكانت الأنواع الستافيلوكوكس قد عزلت من ٢ من الأبقار (٢٠٪) و ٤ إناث الجاموس (٢٠٪)، وكانت الأنواع الاستربتوكوكس قد عزلت من بقرة واحدة (١٠٪) واثنين من الإناث الجاموس (١٠٪) وكان الاكرينوباكتريوم قد عزلت من ثلاث بقرات (٣٠٪) وخمس إناث الجاموس (٣٥٪).