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**REPRODUCTIVE ACTIVITY OF THE HEAT-  
STRESSED RABBIT BUCKS AND ITS  
IMPROVEMENT USING VITAMIN E AND SELENIUM  
UNDER SUBTROPICAL EGYPTIAN CONDITION**  
(With 5 Tables and 4 Plates)

By

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**النشاط التناسلي في ذكور الأرانب المعرضة للإجهاد الحراري وتحسين أدائها  
باستخدام فيتامين E والسيلينيوم تحت الظروف الشبه الاستوائية المصرية**

**علاء زيدان ، جمال سلومه ، محمود النعاعي ، محمد شعيب ، مديحة الطاهر**

أجريت هذه الدراسة في موسم الصيف وتحت ظروف الإجهاد الحراري على عدد أربعون ذكر و عدد واحد وخمسون أنثى من الأرانب النيوزيلاندي الأبيض. قسمت الذكور إلى أربعة مجاميع في كل مجموعة ١٠ ذكور. استخدمت المجموعة الأولى كمجموعة مقارنة، والمجاميع الثانية، الثالثة والرابعة كمجموعة معاملة. حيث حقنت المجموعة الثانية عضلياً بفيتامين E (١٠٠ وحده دولية/ رأس)، حقنت المجموعة الثالثة بالسيلينيوم (٠,١ مللي/كجم من وزن الجسم الحي) وحقنت المجموعة الرابعة بفيتامين E مع السيلينيوم بنفس الجرعات السابقة. تم قياس التنظيم الحراري للجسم، مقاييس الخصية، الرغبة الجنسية للذكور، صفات السائل المنوي الطبيعية والكيميائية، معدل الإخصاب والحالة الهستولوجية للخصية. أوضحت النتائج انخفاض درجة حرارة المستقيم معنوياً (على مستوى ٠,٠٥)، في حين انخفضت درجة حرارة الجلد ودرجة حرارة صوان الإذن بدرجة غير معنوية في ذكور الأرانب النيوزيلاندي الأبيض المجهد حرارياً في فصل الصيف والتي حقنت بفيتامين E أو السيلينيوم بمفرده أو فيتامين E مع السيلينيوم مقارنة بمجموعة الكنترول، بينما انخفض معدل التنفس بدرجة معنوية (على مستوى ٠,٠٥) في الذكور التي حقنت بفيتامين E مع السيلينيوم فقط. زيادة الرغبة الجنسية وحجم قذفه السائل المنوي والنسبة المئوية لحيوية الحيوانات المنوية وتركيز الحيوانات المنوية وحجم القذف الكلية بدرجة معنوية (على مستوى ٠,٠٥)، بينما انخفضت النسبة المئوية للحيوانات المنوية الميتة والشاذة وشواذ الأكرسوم بدرجة معنوية (على مستوى ٠,٠٥) في ذكور

الأرانب النيوزيلاندى الأبيض المجهد حرارياً فى فصل الصيف والتي حقنت بفيتامين E أو السيلينيوم بمفرده أو فيتامين E مع السيلينيوم مقارنة بمجموعة الكنترول. انخفاض درجة pH السائل المنوى بدرجة غير معنوية، بينما ارتفع تركيز الفركتوز الأولى بدرجة معنوية (على مستوى ٠,٠٥) فى ذكور الأرانب المجهد حرارياً والتي حقنت بفيتامين E أو السيلينيوم بمفرده أو فيتامين E مع مجموعة المقارنة. انخفض تركيز الصوديوم فى بلازما السائل المنوى بدرجة معنوية (على مستوى ٠,٠٥)، بينما ارتفع تركيز الكالسيوم، البوتاسيوم والفوسفور الكلى بدرجة معنوية (على مستوى ٠,٠٥) فى الأرانب المجهد حرارياً والتي حقنت بفيتامين E أو السيلينيوم بمفرده أو فيتامين E مع السيلينيوم عن مجموعة المقارنة. تحسن وزن الخصية، البربخ والغدد المساعدة، حجم الخصية ومحيط الخصية ودرجة نعومه كيس الصفن بدرجة معنوية (على مستوى ٠,٠٥) فى ذكور الأرانب النيوزيلاندى الأبيض المجهد حرارياً والتي حقنت بفيتامين E أو السيلينيوم بمفرده أو فيتامين E مع مجموعة المقارنة. تحسن الحالة الهستولوجية للخصية فى ذكور الأرانب النيوزيلاندى الأبيض المجهد حرارياً فى فص الصيف والتي حقنت بفيتامين E أو السيلينيوم بمفرده أو فيتامين E مع السيلينيوم عن مجموعة المقارنة. زيادة معدل الإخصاب بدرجة معنوية (على مستوى ٠,٠٥) فى إناث الأرانب النيوزيلاندى الأبيض الملقحة من الذكور المجهد حرارياً والتي حقنت بفيتامين E والسيلينيوم (٦٠,٨٧%) عن مجموعة المقارنة (٤٢,٨٦%).

## SUMMARY

Forty bucks and fifty one New-Zealand White rabbit (NZW) does were used. In the summer, heat- stressed rabbit bucks were divided into four groups (10 each). The first group was kept as control. The second, third and fourth groups (treated), were injected intramuscularly with vitamin E (100 IU/ head), selenium (0.1mg/ Kg body weight) or selenium plus vitamin E weakly at the same dose of the previous groups, respectively. Body thermoregulation, testicular measurements, libido, physical and chemical semen characteristics, fertility rate and histological status of the testis of the summer heat- stressed rabbit bucks in the control and treated groups, were recorded. The results showed that, rectal temperature was significantly ( $P<0.05$ ) lower, while skin temperature and ear lobe temperature were insignificantly lower of the summer heat-stressed NZW rabbit bucks injected with Vit. E or Se alone and Vit. E plus Se than the control group, whereas respiration rate was significantly ( $P<0.05$ ) lower with the bucks injected by Vit. E plus Se only. Libido, semen-ejaculate volume, percentage of sperm motility, sperm-cell concentration and total-sperm output were significantly ( $P<0.05$ ) better, while the percentages of dead spermatozoa, sperm abnormalities and acrosomal damage of spermatozoa were significantly ( $P<0.05$ ) lower of the summer heat-stressed NZW rabbit bucks injected with Vit. E or Se

alone and Vit. E plus Se than the control group. Seminal pH was insignificantly lower, while initial fructose concentration was significantly ( $P<0.05$ ) higher of the summer heat-stressed NZW rabbit bucks semen injected with Vit. E or Se alone and Vit. E plus Se than the control group. Seminal sodium concentration was significantly ( $P<0.05$ ) lower, while calcium, potassium and total phosphorus concentrations were significantly ( $P<0.05$ ) higher of the summer heat-stressed NZW rabbit bucks injected with Vit. E or Se alone and Vit. E plus Se than the control group. Testis weight (gm), epididymis weight (gm), accessory glands weight (gm), testicular volume ( $\text{cm}^3$ ), testis tone firmer score and scrotal circumference (cm) were significantly ( $P<0.05$ ) improved of the summer heat-stressed NZW rabbit bucks injected with Vit. E or Se alone and Vit. E plus Se than the control group. Histological status of the testes of the summer heat-stressed NZW rabbit bucks injected with Vit. E or Se alone and Vit. E plus Se were improved as compared to the control group. Fertility rate of NZW rabbit does mated with the summer heat-stressed bucks injected with Vit. E plus Se was significantly ( $P<0.05$ ) higher (60.87%) than the control group (42.86%).

**Key words:** Rabbit semen, heat-stress, vitamin E, selenium, fertility.

## INTRODUCTION

In hot summer, rabbit bucks suffer from disorders in spermatogenesis, libido, semen quality, ejaculatory disturbances and reproductive failure (Zeidan *et al.*, 1997). Undoubtedly, bucks are the basis of the reproductive success in the rabbit farms, but they have not received the attention they should have, mainly if we consider that single buck is affecting the fertility and prolificacy of about one-hundred does, especially with artificial insemination programme (Castellini, 1996).

Alpha-tocopherol acts as a protective agent against polyunsaturated fatty acids peroxidation, the basic action mechanism of vitamin E is focused on the scavenging of peroxy radicals yielding a non-radical product and the tocophyroxyl radical an unusually stable phenoxyl radical that does not propagate the radical chain (Liebber, 1993). Vitamin E acts also as a non-specific biological antioxidant (Liu, 1988). Its deficiency causes reproductive failure in rabbit and as supplementation produces favorable adaptive and reproductive responses either in thermoneutral conditions or when exposed to heat-stress (Hassanein *et al.*, 1995). More specific action of vitamin E is associated

with selenium, in which it protects vital phospholipids from peroxidative change. Combination of vitamin E and sodium selenite have a synergistic effect on enhancement of cell-mediated immunity in rabbit (Liu, 1988). In addition, Vit. E increases animal immunity and Se plays an important role in the immune system functional regulates the metabolism of thyroid hormones (Gore and Qureshi, 1997). Administrated rabbits by Vit. E and Se may play an essential role in correcting the negative nutritional balance of rabbits, during hot summer months (Gore and Qureshi, 1997 and Hughest, 1999). However, such studies in rabbit testicular measurements, semen characteristics and fertility rate during summer season are mostly out of the attention and still obscure.

The present work aimed to study the effects of selenium, vitamin E or both together on the physiological and reproductive performance of the heat-stressed rabbit bucks, under Egyptian hot summer conditions.

## **MATERIALS and METHODS**

The present study was carried out in the Department of Animal Production, Faculty of Agriculture, Zagazig University, Zagazig, Sharkeiya Province, Egypt (30° N). Forty mature NZW rabbit bucks and fifty-one multiparous lactating does and 3.0- 3.5 Kg of body weight (12 months of age), were used in the present work. The rabbit bucks were healthy and clinically free of external and internal parasites and were raised in flat deck batteries with universal specifications. The batteries were accommodated with feeders and automatic fresh water drinkers and were efficient for hygienic control. Feeding was carried out according to NRC (1977), recommendations. Mean values of air temperatures, percentages of relative humidity, temperature- humidity index (THI) and length of day light (hrs) values in the Rabbitry during the experimental were recorded and shown in Table 1.

The temperature- humidity index (THI) was estimated according to Livestock and Poultry Heat-Stress Indices, Agricultural Engineering Technology Guide, Clemson University, Clemson SC 29634, USA, using the following formula:  $THI = db^{\circ}F - (0.55 - 0.55 RH)$  ( $db^{\circ}F - 58.00$ ), where:  $db^{\circ}F$  = dry bulb temperature in Fahrenheit and  $RH$  = relative humidity ( $RH \% \div 100$ ). The obtained values of THI were classified as follows: less than 82 = absence of heat-stress, 82 to < 84 = moderate heat-stress, 84 to < 86 = severe heat-stress, and over 86 = very severe heat -stress.

The rabbit bucks were divided into four groups (10 each) nearly equal in average 3.0 – 3.5 Kg of the body weight. The first group was kept as control. The bucks in the second, third and fourth groups (treated) were injected intramuscularly weekly with vitamin E (100 IU/head as dl- $\alpha$  tocopherol acetate: Cairo Company for Medicine) dissolved in soybean oil, selenium (0.1mg selenium/Kg body weight as sodium selenite) and selenium plus vitamin E at the same dose of the previous groups, respectively.

Before slaughter, testicular volume ( $\text{cm}^3$ ), scrotal circumference (cm) and testis tone firmer score, were recorded. Testes, epididymis and accessory glands were weighed to the nearest gram by an ordinary balance after slaughter. Testicular volume ( $\text{cm}^3$ ) was calculated by multiplying length X breadth X depth of the testis by ordinary caliper as described by Weibel (1989). Scrotal circumference was measured with a flexible cloth measuring tape around the largest diameter of the testis and scrotum placed after pushing the testis firmly into the scrotum (Mickelsen *et al.*, 1982). Testis tone firmer score was determined via manual palpation (scored from very soft and 9: very firm) as described by Wildeus and Hammond (1993).

Rectal temperature, ear lobe temperature, skin temperature and respiration rate were measured at 12.00 a.m. three times weekly during the experimental period. Rectal temperature was obtained gently by inserting the clinical thermometer for 2-3 cm in the rectum for two minutes. Skin temperature (between neck and loin, medial dorsal surface) was measured from one location on the body surface. The thermometer was fixed on the bare skin and on fur which was combed back into place by finger. Ear lobe (in the central area of auricle) temperature was measured by a clinical thermometer. The thermometer was placed into direct contact with the central area of the auricle. Respiration rate was determined by counting the frequency of flank movements per one minute. All possible precautions were taken in consideration to avoid disturbing the rabbit bucks, including counting the respiration breaths just before measuring the body temperature.

Semen was collected from rabbit bucks twice weekly by means of an artificial vagina between 08:00 and 10:00 a.m. Libido, physical semen characteristics (semen- ejaculate volume, percentage of sperm motility, dead spermatozoa and sperm abnormalities, acrosomal damage, sperm- cell concentration and total-sperm output) and chemical semen characteristics (hydrogen-ion concentration, initial fructose concentration, sodium, potassium, calcium and total phosphorus

concentrations), were determined. Libido was recorded as described by Chenoweth (1981). Physical semen characteristics were estimated according to Salisbury *et al.* (1978). Acrosomal damage of spermatozoa was examined by staining films according to Watson (1975). Seminal hydrogen-ion concentration (pH) was measured by Universal Indicator Paper and Standard Commercial Stains according to Karras (1952). Initial fructose concentration was measured according to Barakat and El-Sawaf (1964). Total phosphorous, sodium, potassium and calcium concentrations in the seminal plasma were determined colourimetrically according to the method described by Kuttner and Liechtenstein (1930), Trinder (1951), Sunderman Jr and Sunderman (1958) and Gindler (1972), respectively.

In the fertility trial, fifty-one multiparous lactating NZW rabbit does transferred to the bucks cage to be mated and returned back to its cage after mating. Each doe was subjected to two services from the heat – stressed rabbit bucks (control group) and bucks treated with Vit. E plus Se.

Pregnancy was diagnosed by abdominal palpation at day 10 from the date of service. All does were mated one day after kindling (day of kindling =0). Does were failed to conceive were immediately re-mated after pregnancy testing. Fertility rate at birth was recorded.

After slaughter, five randomly samples of the testes in each group were removed and then fixed in Bouins solution. Representative samples were washed, dehydrated in ascending grades of ethyl-alcohol, cleared and embedded in paraffin –wax. Thereafter, the samples were sectioned at 5 microns thickness and stained with haematoxylin and stained with eosin then examined using 400 X objective of a phase contrast microscope. Histological studies of the testis were recorded.

Data were subjected to analysis of variance according to Snedecor and Cochran (1982). Percentage values were transformed to Arc-sin values before being statistically analyzed. Duncan's new multiple rang test was used for the multiple comparisons (Duncan, 1955). The fertility rates were analyzed using Chi-square test.

## RESULTS

### Temperature – humidity index (THI)

The temperature- humidity index (THI) estimated in Table 1 indicated exposure of the rabbit bucks to severe heat- stress during summer season.

### **Body thermoregulation:**

Table 2 shows that, the effect of the hot summer season on the rectal temperature of the heat-stressed NZW rabbit bucks injected with Vit. E or Se alone and Vit. E plus Se was significantly ( $P < 0.05$ ) lower, whereas respiration rate was significantly ( $P < 0.05$ ) lower with the bucks injected by Vit. E plus Se only. While, skin temperature and ear lobe temperature was insignificantly lower in the treated groups than the control group. Results indicated that, rectal temperature, ear lobe temperature and skin temperature were insignificantly difference of the summer heat – stressed NZW bucks injected with Vit. E or Se alone and Vit. E plus Se. While, respiration rate was significantly ( $P < 0.05$ ) lower of the bucks injected with Vit. E plus Se than Vit. E or Se alone. The highest ( $P < 0.05$ ) value of the rectal temperature and respiration rate of the summer heat-stressed rabbit bucks was recorded in the control group and the lowest ( $P < 0.05$ ) value was recorded for the heat-stressed rabbit bucks injected with Vit. E plus Se. The lowest values of the skin temperature and ear lobe temperature were recorded of the summer heat-stressed rabbit bucks injected with Vit. E plus Se and the highest value with the non – injected bucks (control group).

The change rates of the rectal temperature, skin temperature, ear lobe temperature and respiration rate of the summer heat-stressed NZW rabbit bucks injected with Vit. E or Se alone and Vit. E plus Se were insignificantly negative difference.

### **Libido and physical semen characteristics**

Table 3 shows that, the effect of the hot summer season on libido was significantly ( $P < 0.05$ ) better of the heat-stressed NZW rabbit bucks injected with Vit. E or Se alone and Vit. E plus Se than the control group. The longest ( $P < 0.05$ ) time of libido was recorded of the summer heat-stressed rabbit bucks (control group) and the shortest ( $P < 0.05$ ) time with the rabbit bucks injected with Vit. E plus Se.

Significantly ( $P < 0.01$ ) negative change rate in the libido was recorded of the summer heat-stressed NZW rabbit bucks injected with Vit. E or Se alone and Vit. E plus Se.

The effect of the hot summer season on semen-ejaculate volume, percentage of sperm motility, sperm-cell concentration and total-sperm output was significantly ( $P < 0.05$ ) higher of the heat-stressed NZW rabbit bucks injected with Vit. E or Se alone and Vit. E plus Se than the control group. However, the percentages of dead spermatozoa, sperm abnormalities and acrosomal damage were significantly ( $P < 0.05$ ) lower of the treated heat-stressed bucks than the control group. The highest

( $P < 0.05$ ) values of semen-ejaculate volume, percentage of sperm motility, sperm-cell concentrate and total-sperm output were recorded of the summer heat-stressed rabbit bucks injected with Vit. E plus Se and the lowest ( $P < 0.05$ ) value with the control group. While, the lowest ( $P < 0.05$ ) values of the percentages of dead spermatozoa, sperm abnormalities and acrosomal damage were recorded with the treated bucks and the highest ( $P < 0.05$ ) values with the control group. Libido, percentages of dead spermatozoa, sperm abnormalities and acrosomal damage decreased significantly ( $P < 0.05$ ), while semen-ejaculate volume, percentage of sperm motility, sperm-cell concentration and total sperm-output increased significant ( $P < 0.05$ ) of the summer heat-stressed bucks injected with Vit. E plus Se as compared to Vit. E or Se alone. The differences between bucks injected with either Vit. E or Se alone were insignificantly for all the previously measurements.

Significantly ( $P < 0.01$ ) positive change rates in the semen-ejaculate volume, percentage of sperm motility, sperm-cell concentration and total-sperm output were recorded of the summer heat-stressed rabbit bucks injected with Vit. E or Se alone and Vit. E plus Se. While, significantly ( $P < 0.01$ ) negative change rate was detected in the percentages of dead spermatozoa, sperm abnormalities and acrosomal damage.

#### **Chemical semen characteristics**

Data obtained in Table 4 shows that, the effect of the hot summer season on of the pH value was insignificantly lower of the heat-stressed NWZ rabbit bucks semen injected with Vit. E or Se alone and Vit. E plus Se than the control group. The highest value of pH was recorded of the summer heat-stressed rabbit bucks in the control group and the lowest value in the rabbit bucks injected with Se alone. The pH value insignificantly decreased of the summer heat-stressed bucks injected with Vit. E plus Se as compared to Vit. E or Se alone. The differences between bucks injected with either Vit. E or Se alone were insignificantly for the previously measurement.

Significantly ( $P < 0.01$ ) negative change rates were recorded in seminal pH of the summer heat-stressed NZW rabbit bucks injected with Vit. E or Se alone and Vit. E plus Se.

The effect of the hot summer season on seminal initial fructose concentration was significantly ( $P < 0.05$ ) higher of the heat-stressed NZW rabbit bucks injected with Vit. E or Se alone and Vit. E plus Se than the control group. The highest ( $P < 0.05$ ) value of seminal initial fructose concentration was recorded of the summer heat-stressed rabbit



bucks injected with Vit. E plus Se and the lowest ( $P < 0.05$ ) value was recorded with the control group. The differences between bucks injected with either Vit. E or Se alone were insignificantly for the previously measurement.

Significantly ( $P < 0.05$  or  $P < 0.01$ ) positive change rates were recorded in seminal initial fructose concentration of the summer heat-stressed NZW rabbit bucks injected with Vit. E or Se alone and Vit. E plus Se.

#### **Seminal electrolytes concentration (mg/100ml):**

Table 4 showed that, the effect of the hot summer season on seminal potassium, calcium and total phosphorus concentrations were significantly ( $P < 0.05$ ) higher of the heat-stressed NZW rabbit bucks semen injected with Vit. E or Se alone and Vit. E plus Se than the control group. However, seminal sodium concentration was significantly ( $P < 0.05$ ) lower of the treated heat-stressed bucks than the control groups. The highest ( $P < 0.05$ ) values of potassium and total phosphorus concentrations were recorded with the summer heat-stressed rabbit bucks semen injected with Vit. E plus Se and Vit. E alone with the calcium and the lowest ( $P < 0.05$ ) value was recorded with the control group. While, the lowest ( $P < 0.05$ ) value of the seminal sodium concentration was recorded with the treated bucks with Vit. E. plus Se and the highest ( $P < 0.05$ ) value was recorded with the control group. The differences between bucks injected with either Vit. E or Se alone were insignificantly for all the previously measurements

Significantly ( $P < 0.01$ ) positive change rates were recorded in seminal potassium, calcium and total phosphorus concentrations, while significantly ( $P < 0.01$ ) negative in seminal sodium concentration of the summer heat-stressed NZW rabbit bucks injected with Vit. E or Se alone and Vit. E plus Se.

#### **Testicular and gonadal measurements:**

Data presented in Table 5 shows that, the effects of the hot summer season on the testis weight (gm), epididymis weight (gm) and accessory glands weight (gm) were significantly ( $P < 0.05$ ) heavier of the heat-stressed NZW rabbit bucks injected with Vit. E or Se alone and Vit. E plus Se than the control group. The highest ( $P < 0.05$ ) values of the testis weight (gm), epididymis weight (gm) and accessory glands weight (gm) were recorded with the summer heat-stressed bucks injected with Vit. E plus Se and the lowest ( $P < 0.05$ ) values were recorded with the control group.

The effect of the hot summer season on the testicular volume, testis tone firmer score and scrotal circumference were significantly ( $P < 0.05$ ) higher of the heat-stressed NZW rabbit bucks injected with Vit. E or Se alone and Vit. E plus Se. The highest ( $P < 0.05$ ) values of the testicular volume, testis tone firmer score and scrotal circumference were recorded of the summer heat-stressed rabbit bucks injected with Vit. E plus Se and the lowest ( $P < 0.05$ ) value was recorded with the control group. Testes weight, epididymis weight, accessory glands weight, testicular volume, testes tone firmer score and scrotal circumference increased significantly ( $P < 0.05$ ) of the summer heat-stressed bucks injected with Vit. E plus Se as compared to Vit. E or Se alone. The differences between bucks injected with either Vit. E or Se alone were insignificantly for all the testicular and gonadal measurements.

Significantly ( $P < 0.01$ ) positive change rates in the testis weight (gm), epididymis weight, accessory glands weight, testicular volume, testis tone firmer score and scrotal circumference were recorded of the summer heat-stressed NZW rabbit bucks injected with Vit. E or Se alone and Vit. E plus Se.

#### **Fertility rate**

Table 6 shows that, the fertility rate was significantly ( $P < 0.05$ ) increased of the NZW does that mated with the summer heat-stressed bucks injected with Vit. E plus Se (60.87 %) as compared to the control group (42.86 %).

#### **Histological status in the testes**

In the hot summer after the intramuscular injection of the heat-stressed NZW rabbit bucks with Vit. E (Plate 1), Se (Plate 2) and Vit. E plus Se (Plate 3), there is an increase in the activity of the testis as compared with that in the summer without any treatment (Plate 4). So, the injection of the heat-stressed NZW bucks with Vit. E or Se alone improved the activity of the testis, function of spermatogenesis stages, increased the number of the normal, healthy and motile spermatozoa during summer. In addition, intramuscular injection of the heat-stressed NZW rabbit bucks with Vit. E plus Se revealed more activity of the testis in the summer than those injected by Vit. E or Se alone and the control group as shown in Plate 3. The variations among groups may be due to treatment by Vit. E or Se alone and Vit. E plus Se or due to the differences in testosterone hormone levels between bucks.

Table 1 : Mean air temperature (°C), daylight length, relative humidity (%) and temperature-humidity index (THI) values, during the different seasons of the year.

Seasons of the year	Air temperature (°C)		Relative humidity (%)		Temperature-humidity index (THI)		Length of daylight (hours)
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	
	Winter	8.86±0.21	19.15±0.35	48.62±0.35	64.33±1.15	45.12	
Spring	13.60±0.18	24.16±0.18	37.41±0.43	52.64±1.21	64.40	70.93	14.13
Summer	20.84±0.32	34.30±0.46	38.83±0.48	53.66±0.95	65.64	84.63	15.24
Autumn	15.43±0.12	28.62±0.42	42.67±0.62	58.42±1.32	59.21	77.68	13.00

Table 2 : Mean values of the body thermoregulation of the summer heat-stressed NZW rabbit bucks and its amelioration using vitamin E, selenium or vitamin E plus selenium .

Items	Control (Summer)				Treatments			
	Vitamin E	Change (%)	Selenium	Change (%)	Vitamin E + Selenium	Change (%)	Selenium	Change (%)
Rectal temperature (°C)	40.12±0.09 <sup>a</sup>	-0.55	39.90±0.08 <sup>b</sup>	-0.52	39.79±0.08 <sup>b</sup>	-0.52	39.79±0.08 <sup>b</sup>	-0.82
Ear lobe temperature (°C)	36.56±0.13	-0.85	36.25±0.22	-1.45	35.80±0.28	-1.45	35.80±0.28	-2.08
Skin temperature (°C)	39.88±0.17	-1.40	39.32±0.11	-0.73	39.30±0.13	-0.73	39.30±0.13	-1.45
Respiration rate (r.p.m.)	101.58±0.51 <sup>a</sup>	-1.45	100.11±0.24 <sup>a</sup>	-0.30	99.80±0.47 <sup>b</sup>	-0.30	99.80±0.47 <sup>b</sup>	-1.75

Means bearing different letters within the same classification, differ significantly (P<0.05).

Table 3 : Mean values of libido and physical semen characteristics of the summer heat-stressed NZW rabbit bucks and its amelioration using vitamin E, selenium or vitamin E plus selenium .

Items	Control		Treatments				
	(Summer)	Vitamin E	Change (%)	Selenium	Change (%)	Vitamin E + Selenium	Change (%)
Libido (seconds)	27.45±0.42 <sup>a</sup>	6.18±0.16 <sup>b</sup>	-77.49**	6.10±0.12 <sup>b</sup>	-77.78**	4.12±0.11 <sup>c</sup>	-84.99**
Semen-ejaculate volume (ml)	0.40±0.05 <sup>c</sup>	0.57±0.02 <sup>b</sup>	42.50**	0.61±0.04 <sup>b</sup>	52.50**	0.82±0.04 <sup>a</sup>	105.00**
Sperm motility (%)	54.13±1.03 <sup>c</sup>	62.48±1.25 <sup>b</sup>	15.43**	62.84±1.16 <sup>b</sup>	16.09**	71.40±1.13 <sup>a</sup>	31.90**
Dead spermatozoa (%)	32.17±1.06 <sup>a</sup>	24.05±1.05 <sup>b</sup>	-25.24**	23.86±1.08 <sup>b</sup>	-25.83**	18.16±1.10 <sup>c</sup>	-43.55**
Sperm abnormalities (%)	20.72±1.14 <sup>a</sup>	16.22±1.02 <sup>b</sup>	-21.72**	16.18±1.12 <sup>b</sup>	-21.91**	12.26±1.05 <sup>c</sup>	-40.83**
Acrosomal damage (%)	15.64±0.82 <sup>a</sup>	11.06±0.24 <sup>b</sup>	-29.28**	10.85±0.35 <sup>b</sup>	-30.63**	5.14±0.52 <sup>c</sup>	-67.14**
Sperm-cell concentration (x10 <sup>6</sup> /ml)	127.23±25.18 <sup>c</sup>	240.25±24.17 <sup>b</sup>	88.83**	245.17±29.18 <sup>b</sup>	92.70**	286.28±22.16 <sup>a</sup>	125.01**
Total-sperm output (x10 <sup>6</sup> /ejaculate)	50.89±16.14 <sup>c</sup>	134.54±13.20 <sup>b</sup>	164.37**	147.70±18.16 <sup>b</sup>	190.23**	234.75±17.24 <sup>a</sup>	361.29**

Means bearing different letters within the same classification, differ significantly (P<0.05).  
\*\* (P < 0.01)

Table 4 : Mean values of some chemical semen characteristics of the summer heat – stressed NZW rabbit bucks and its amelioration using vitamin E, selenium or vitamin E plus selenium .

Items	Control			Treatments			
	(Summer)	Vitamin E	Change (%)	Selenium	Change (%)	Vitamin E + Selenium	Change (%)
Hydrogen-ion concentration (pH)	7.24±0.18 <sup>NS</sup>	7.02±0.15 <sup>NS</sup>	-3.04 <sup>**</sup>	6.80±0.14 <sup>NS</sup>	-6.08 <sup>**</sup>	6.86±0.14 <sup>NS</sup>	-5.25 <sup>**</sup>
Initial fructose (mg/100ml)	253.86±8.12 <sup>c</sup>	278.19±8.15 <sup>b</sup>	9.58 <sup>*</sup>	286.14±7.28 <sup>b</sup>	12.72 <sup>*</sup>	308.16±10.15 <sup>a</sup>	21.39 <sup>**</sup>
Sodium (mg/ 100ml)	125.74±6.31 <sup>a</sup>	114.62±5.84 <sup>b</sup>	-8.84 <sup>**</sup>	116.15±6.04 <sup>b</sup>	-7.63 <sup>**</sup>	112.27±6.13 <sup>b</sup>	-10.71 <sup>**</sup>
Potassium (mg/ 100ml)	5.92±0.82 <sup>c</sup>	7.65±0.81 <sup>b</sup>	29.22 <sup>**</sup>	7.14±0.75 <sup>b</sup>	20.61 <sup>**</sup>	9.82±0.68 <sup>a</sup>	65.88 <sup>**</sup>
Calcium (mg/ 100ml)	5.23±0.17 <sup>c</sup>	6.82±0.28 <sup>a</sup>	30.40 <sup>**</sup>	6.78±0.19 <sup>a</sup>	29.64 <sup>**</sup>	6.12±0.24 <sup>b</sup>	17.02 <sup>**</sup>
Total phosphorus (mg/100 ml)	29.36±1.14 <sup>c</sup>	34.15±1.18 <sup>b</sup>	16.31 <sup>**</sup>	34.28±2.04 <sup>b</sup>	16.76 <sup>**</sup>	38.65±1.27 <sup>a</sup>	31.64 <sup>**</sup>

Means bearing different letters within the same classification, differ significantly (P<0.05).

\*\* (P < 0.01)

\* (P<0.05)

NS: Not significant

Table 5 : Mean values of the testicular measurements of the summer heat-stressed NZW rabbit bucks and its amelioration using vitamin E, selenium or vitamin E plus selenium .

Items	Control		Treatments				
	(Summer)	Vitamin E	Change (%)	Selenium	Change (%)	Vitamin E + Selenium	Change (%)
Testis weight (gm)	5.86±0.35 <sup>b</sup>	6.72±0.13 <sup>a</sup>	14.68 <sup>**</sup>	6.76±0.12 <sup>a</sup>	15.36 <sup>**</sup>	6.84±0.17 <sup>a</sup>	16.73 <sup>**</sup>
Epididymis weight (gm)	2.54±0.18 <sup>b</sup>	3.10±0.15 <sup>a</sup>	22.05 <sup>**</sup>	3.14±0.13 <sup>a</sup>	23.62 <sup>**</sup>	3.61±0.17 <sup>a</sup>	24.41 <sup>**</sup>
Accessory glands weight (gm)	2.08±0.16 <sup>c</sup>	2.82±0.12 <sup>b</sup>	35.58 <sup>**</sup>	2.85±0.14 <sup>b</sup>	37.02 <sup>**</sup>	3.26±0.15 <sup>a</sup>	56.73 <sup>**</sup>
Testicular volume (cm <sup>3</sup> )	4.52±0.18 <sup>c</sup>	5.78±0.15 <sup>b</sup>	27.88 <sup>**</sup>	5.82±0.16 <sup>b</sup>	28.76 <sup>**</sup>	6.54±0.19 <sup>a</sup>	44.69 <sup>**</sup>
Testis tone firmer (Score)	5.82±0.29 <sup>c</sup>	6.81±0.10 <sup>b</sup>	17.01 <sup>**</sup>	6.86±0.13 <sup>b</sup>	17.87 <sup>**</sup>	7.68±0.11 <sup>a</sup>	31.96 <sup>**</sup>
Scrotal circumference (cm)	6.32±0.35 <sup>c</sup>	7.58±0.12 <sup>b</sup>	19.94 <sup>**</sup>	7.65±0.10 <sup>b</sup>	21.04 <sup>**</sup>	8.11±0.18 <sup>a</sup>	28.32 <sup>**</sup>

Means bearing different letters within the same classification, differ significantly (P < 0.05).

\*\* (P < 0.01)

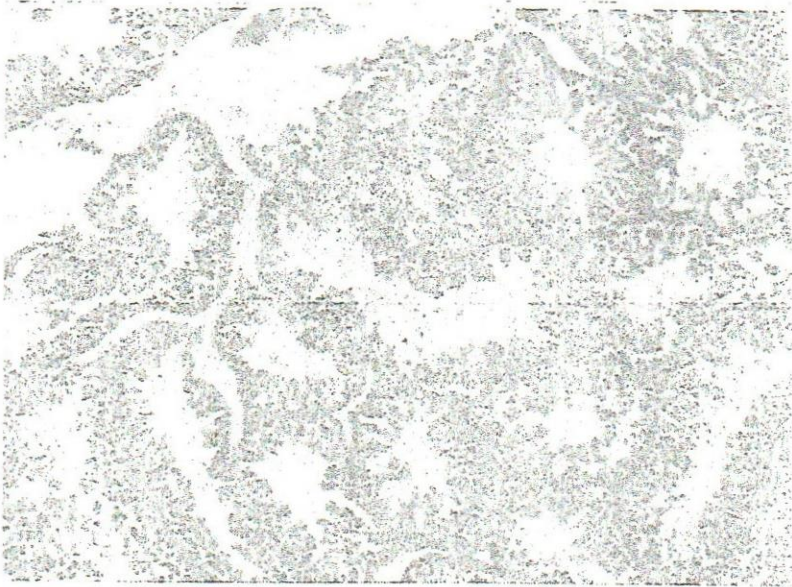
**Table 6:** Fertility rate of NZW rabbit does mated with the summer heat-stressed rabbit bucks injected with vitamin E plus selenium.

Items	Summer	
	Control	Vitamin E plus selenium
No. of does mated	28	23
No. of does conceived	12	14
Fertility rate	42.86 <sup>b</sup>	60.87 <sup>a</sup>

Means bearing different letters within the same classification, differ significantly ( $P < 0.05$ ).



**Plate 1:** A histological section in the testis of the heat-stressed rabbit bucks injected with vitamin E, showing slightly improvement of the testes and spermatogenesis are present (Stained by H & E at 400 p).



**Plate 2:** A histological section in the testis of the heat-stressed rabbit bucks injected with selenium showing stages of spermatogenesis and Sertoli cells and interstitial tissues are present (Stained by H & E at 400 p).



**Plate 3:** A histological section in the testis of the heat-stressed rabbit bucks injected with vitamin E plus selenium showing very clear spermatogenesis stages, active testis and Sertoli cells and interstitial tissues are present (Stained by H & E at 400 p).





**Plate 4:** A histological section in the testis of the rabbit bucks during summer revealed inactive testis, no spermatozoa and Sertoli cells (Stained by H & E at 400 p).

## DISCUSSION

The results of the present work revealed that, the rectal temperature decreased significantly of the summer heat-stressed NZW rabbit bucks at all treatment groups as compared to the control group, while skin temperature and ear lob temperature decreased insignificantly. Respiration rate decreased significantly in the bucks treated with Vit. E plus Se as compared to the control group. Similar trends were reported by Zeidan *et al.* (2001) and Ghoname (2004). Tizard (1995), Bedmorek *et al.* (1996) and Hamdy and El-Malt (2000) who reported that selenium has beneficial effect on thyroid hormones metabolism and immunity and consequently, improved the biological effect of the physiological traits on the heat-stressed bucks. Furthermore, Vit. E interacts with Se to prevent the oxidative breakdown of cell membranes associated with the hydroperoxides of polyunsaturated fatty acids. Gore and Qureshi (1997) and Hamdy and El-Malt (2000) also

reported that Vit. E interacts with Se to protect tissue membranes from lipid peroxidation caused by free radical attack.

Concerning libido and physical semen characteristics, the obtained results showed a significant better in libido of the treated heat – stressed NZW bucks groups as compared to the control group. The results obtained also showed that, the heat-stressed NZW rabbit bucks treated with Vit. E or Se alone and Vit. E plus Se increased significantly semen-ejaculate volume, percentage of sperm motility, sperm-cell concentration and total-sperm output as compared to the control group. While, the percentages of dead spermatozoa, sperm abnormalities and acrosomal damage decreased significantly of the treated heat-stressed rabbit bucks groups as compared the control group. Similar trends were reported by Castellini *et al.* (1999), Zeidan *et al.* (2001) and Ghoname (2004). These findings may be due to the important role of Vit. E and Se on the epithelial cells of reproductive tract of bucks that responsible for acquiring the semen quality or due to the maintaining the viability and permeability of cell membranes of the spermatozoa. Vit. E and Se also have complementary effect on stimulating and promoting the function of immune system (Hughes, 1999). In addition, the improvement of semen quality of the heat-stressed

rabbit bucks also may be due to the biological stimulating and promoting the function of immune system (Hughes, 1999). Hamdy and El-Malt (2000) found that the improvement of semen quality of the heat-stressed may be due to the biological effect of Vit. E on enzymatic oxidation and reduction, nucleic acid metabolism and promoting the activity of oxidized substances such as vitamin A and carotenoids.

With regard to chemical semen characteristics, the heat – stressed NZW rabbit bucks treated with Vit. E or Se alone and Vit. E plus Se decreased insignificantly seminal pH value, while increased significantly seminal initial fructose, potassium, calcium and total phosphorus concentrations as compared to the control group. In contrast, seminal sodium concentration decreased significantly of the treated bucks groups as compared to the control group. These results may be due to the higher sperm-cell concentration of the rabbit bucks treated with Vit. E and Se than the control group. Similar trends were reported by El-Masry *et al.* (1994), Zeidan *et al.* (2001) and Ghoname (2004). The low pH value recorded with the rabbit bucks injected with Vit. E plus Se could be due to the high sperm-cell concentration reflected the important role of Vit. E and Se in semen quality. Castellini *et al.* (1999) and Zeidan *et al.*

(2001) found that fructose concentration was significantly ( $P < 0.05$ ) increased of the male rabbits treated with Vit. E alone.

Regarding testicular and gonadal measurements, testis weight, epididymis weight, accessory glands weight, testicular volume, testis tone firmer score and scrotal circumference were tended to be better of the heat-stressed NZW rabbit bucks treated with Vit. E or Se alone and Vit. E plus Se than the control group. Similar trends were reported by Tengerdy *et al.* (1984), Tizard (1995), Zeidan *et al.* (2001) and Ghoname (2004). The reduction in testis weight during summer may be due to exposure of the bucks to heat-stress which due to degeneration in the germinal epithelium and to a partial atrophy in the seminiferous tubules (Chou *et al.*, 1974). In addition, the reduction in the testicular and gonadal measurements may be due to the quantity of spermatozoa or testicular and epididymal fluids which may affect the weight of tail epididymis or may be due to the differences in the development of spermatogenesis (Fujii, 1976).

The results obtained also revealed that, the fertility rate of the NZW does that mated with the heat - stressed bucks treated with Vit. E plus Se was tended to be higher than the control group. Similar trends were reported by El-Masry *et al.* (1994) and Zeidan *et al.* (2003). Castellini *et al.* (1999) confirmed that Vit. E dietary addition for male rabbits insignificantly increased fertility rate. These results may be due to the increase activity of Leydig cells and spermatogenesis process and consequently, improved of semen quality which may be due to the biological effects of Vit. E and Se on enzymatic oxidation and promoting the activity of oxidized substances such as Vit. A or may be due to interaction between Vit. E and Se to prevent the oxidative breakdown of sperm cell membrane.

With regard to histological status, intramuscular injection of the summer heat - stressed NZW rabbit bucks with Vit. E or Se alone and Vit. E plus Se revealed more activity of the testes and spermatogenesis than those without injection. Adamopoulos *et al.* (1990) concluded that in the pre-pubertal rabbit testosterone plays an important role in development and maturation of the testis. Also, Berger *et al.* (1976) found that testosterone may play a role in differentiation and maturation of the rabbit germ cells. These results are in agreement with those obtained by Zeidan *et al.* (1997) and Ghoname (2004). In addition, testes in the rabbit bucks during summer season showed inactive testis, no spermatozoa or sertoli cells and mild testicular degeneration represented by pyknotic nuclei of

the spermatogonia and the lumen of the seminiferous tubules with low spermatocytes (Zeidan *et al.*, 1997).

In conclusion, body thermoregulation, libido, semen quality, fertility rate, testicular activity, histological status of the testes of the summer heat-stressed NZW rabbit bucks injected with Vit. E or Se alone and Vit. E plus Se were better than the un-injected group. Therefore, under Egyptian hot summer conditions, the amelioration of the heat-stressed rabbit bucks using Vit. E plus Se could be used for improving their testicular activity, semen quality and fertility rate as a therapy, simply and applicable techniques for temporary summer sterility which commonly occurs for mostly male rabbits during exposure to hot summer conditions.

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## SUMMARIES OF THESIS

***Wageeh Anwar Boulis Add Al-Said, Ph.D., Hygiene and Control of Meat, Fish and Their Products and Animal by-products, 2005.***

**Public Health Importance of Camels' Carcasses in Assiut Governorate.**

The bacterial quality of carcass surface as well as the musculature of 36 camels' carcasses slaughtered in some Assiut Governorate slaughterhouses was investigated. Shoulders and thighs surfaces of the examined camels' carcasses were found contaminated with different levels of aerobic bacteria, *Enterobacteriaceae*, coliforms, faecal coliforms, *E. coli*, *Staph aureus* and *Clostridium perfringens* with non significant differences between the tested surfaces except in the *C. perfringens* count. Regarding camels' carcasses musculatures, a total of 130, 122 and 119 bacterial isolates were recovered from the examined forequarters, hindquarters and diaphragmatic muscles. The identified microorganisms were *Bacillus cereus*, members of *Enterobacteriaceae*, *Listeria monocytogenes*, *Staph aureus* and *Strept faecalis*. On the other hand, 952 out of 3934 camels' carcasses (24.20%) were found to contain localized lesions (24.15%) or generalized affections as obtained from Assiut Veterinary Authority records during 1995–2003. The public health significance of the recovered microorganisms from the examined camels' carcasses was discussed.

***Aya Galal Saad El-Deen, Ph.D., Fish Diseases, 2005.***

**Some studies on Edwardsiellosis in Catfish *Clarias gariepinus*, in Assiut Governorate**

120 fish were subjected to clinical, postmortem and bacteriological examination. Bacteriological examination of fish showing clinical signs resulted in isolation of 166 isolates which are close in morphological, and cultural characters to *Enterobacteriaceae*. According to morphological, cultural and biochemical characters the 166 isolates were identified as *Edwardsiella tarda* (42), *Proteus vulgaris* (20), *Escherichia coli* (16), *Citrobacter sp.* (15), *Salmonella sp.* (13), *Serratia sp.* (12), *Proteus mirabilis* (9), *Morganella morganii* (7), and there were 32 isolates that have not been identified. The rates of natural infection in *C. gariepinus* were 43.3% and 50% in the Spring and Summer, respectively, and were 13.3%, 10% in Autumn and Winter with 29.17% overall prevalence rate over the year of study. Clinical signs of fish experimentally infected with *E. tarda* were abscess developed on the

caudal portion of the body. Internal findings included clotted haemorrhage in the abdominal cavity and accumulation of bloody exudates (ascitis) in the abdominal cavity. Antibacterial sensitivity tests showed that the isolated *E. tarda* were highly sensitive to oxytetracycline, chloramphenicol, sulpha-trimethoprin, nalidixic acid, furazolidone, oxalonic acid, garamycin and sulfamethazole and resistant to penicillin, erythromycin and amoxicillin + clavulanic acid.

***Kamal Mohamed Galal, Ph.D., Clinical Laboratory Diagnosis, 2005.***

**Health hazards on sheep rearing on polluted grass and water in some localities in Assiut Governorate.**

This investigation revealed a highly significant increase of heavy metals levels in both grass and surface water than the permissible limits in all localities of study. Also highly significant increase in the levels of heavy metals in blood serum of exposed sheep were recorded. The clinical signs included general signs as emaciation, anorexia anemia and foul faetied diarrhea or constipation. Specific signs of fluorosis included dark colouration mottling of incisor teeth and elongation of the hooves. Specific signs of lead and cadmium toxicity were staggering in gait, difficult in movement, unresponsive to external stimuli and blindness. The haematological picture showed a highly significant decrease in total erythrocytic coun, leucocytic count haemoglobin and packed cell volum D.L.C revealed lymphopenia, neutropenia, monocytosis and eosinophilia. The biochemical analysis refeled a highly significant decrease in blood serum ascorbic acid level assotiated with hypoproteinemia, hypoalbuminia and hypogloulinemia. The study reflected the effect of pollution with cadmium, lead and flourine upon clinical, haematological, biochemical and immune system of exposed sheep.

***Mahmoud Ammar Mohamed, Ph.D., Hygiene and Control of Meat, Fish and Their Products and Animal by-products, 2005.***

**Spoilage and pathogenic microorganisms in traditional meat products in Assiut.**

150 samples comprised three traditional meat products namely kabab, kofta and shawerma (25 raw and 25 ready-to-eat of each) were collected from different restaurants in Assiut. Regarding the microbiological status of the examined raw kabab, kofta and shawerma, the mean values of aerobic plate, psychrotropic, *Enterobactriaceae*, mould and yeast counts/g were  $2 \times 10^6$ ,  $2 \times 10^5$ ,  $7 \times 10^2$ ,  $1 \times 10^2$  and  $3 \times 10^4$  CFU/ g in



kabab;  $2 \times 10^7$ ,  $3 \times 10^6$ ,  $6 \times 10^4$ ,  $7 \times 10$  and  $4 \times 10^2$  in kofta;  $3 \times 10^7$ ,  $2 \times 10^7$ ,  $6 \times 10^5$ ,  $1 \times 10^2$  and  $1 \times 10^5$  is shawerma, respectively. As for coliforms, all the examined raw samples were contaminated with such organisms in levels varied from 3 to  $> 10^3$  MPN/g. Members of *Enterobacteriaceae* recovered from the examined raw kabab, kofta and shawerma were *Citrobacter diversus* 34.6%, *C. freundii* 21.3%, *Edwardisella tarda* 5.3%, *Enterobacter aerogenes* 22.6%, *Enterobacter cloacae* 16%, *E. coli* 50.6%, *Kelbsiella oxytoca* 12.4%, *K. pneumoniae* 10.6%, *Leminorella spp.* 8%, *Morganella morganii* 14.6%, *Proteus spp.* 42.7%, *Providencia spp.* 6.4%, *Salmonella spp.* 22.6%, *Shigella spp.* 4% and *Yersinia pseudotuberculosis* 1.3%. The bacteriological analysis of ready – to – eat (RTE) samples cleared that the mean values of aerobic plate, *B. cereus* and *S. aureus* counts /g of examined RTE kabab, kofta and shawerma were  $4 \times 10^2$ ,  $6 \times 10^2$  and  $1 \times 10^2$  CFU /g in kabab;  $3 \times 10^5$ ,  $6 \times 10^2$  and  $1 \times 10^3$  CFU/g in kofta and  $2 \times 10^2$ ,  $9 \times 10^2$  and  $2 \times 10^3$  CFU /g in shawerma, respectively. As for coliforms, 36% of the examined RTE samples were contaminated with coliforms in levels varied from 3 to  $> 10^3$  MPN/g. *Salmonella spp.* and coagulase-positive *S. aureus* were recovered from 5.3 and 16% of examined RTE samples, respectively. In a trial to study the effect of some spices and herbs materials on some spoilage and food poisoning microorganisms, the 1<sup>st</sup> trial was conducted to estimate the minimum inhibitory concentrations (MICs) and minimal lethal concentrations (MLCs) of garlic juice; onion juice, alcoholic extract, aqueous and total oil of Barka seeds; total oil and alcoholic extract of fenugreek; alcoholic extract of termis and alcoholic and aqueous extracts of coriander. The alcoholic extract of Barka seeds was the most effective against the tested microorganisms, where the MICs were 50, 250, 126, 63 and 63 mg/ml for *E. coli* O157: H7, *S. typhimurium*, *Staph. aureus*, *Proteus spp.* and *Pseudomonas aeruginosa*, respectively. The corresponding values of MLCs were 31.3, 31.3, 31.3, 1.25 and 31.3 mg / ml, respectively. The 2<sup>nd</sup> trial was conducted to estimate the effect of the alcoholic extract of Barka seeds on the attachment and detachment of *S. typhimurium* on meat in comparison with that of lactic acid. It was observed that lactic acid (2%) had a potent antimicrobial effect against *S. typhimurium* on meat and its antibacterial effect continued during storage of treated meat at 4°C for 48h. The application of alcoholic extract of Barka seeds resulted in immediate antibacterial effect against *Salmonella* on meat but its effect diminished during storage of meat at 4°C.

**Ashraf Mohammed Abd-El Malek, Ph. D., Meat Hygiene, 2005.**

**Assessment of some meat products for the occurrence of *Escherichia coli* O157:H7.**

225 samples of beefburger, minced meat and sausage (75 of each) were collected and examined for the presence of *E.coli* O157:H7. The only suspect latex agglutination test sample of beefburger found contaminated with *E. coli* O157: H7 that confirmed by PCR. The MIC of garlic extract against *E.coli* O157:H7 was 1.56% (w/v), while the MLC was 3.12%(w/v). The inhibitory effect of various EO concentrations indicated that oregano EO followed by thyme EO had the highly inhibitory effects. Spices and spice extracts which had the best inhibitory effects against *E.coli* O1557 should be tested for the food model study. The obtained results showed that garlic 3% has the highest inhibitory effect against *E.coli* O157:H7 at the 3 day of storage with reduction rate of 100%.

**Emad Salah Ahmed, Ph.D., Fish Diseases, 2005.**

**Studies on gills affections in Tilapia species in El - Minia Governorate – Egypt**

The present study was carried out on 900 fish (75 fish / month) from *O. niloticus* of different weight. Fish collected and selected randomly from River Nile tributaries at different localities in El- Minia Governorate within one year. The period of study extended from the beginning of April 2004 till the end of March, 2005. Fish were classified into three groups according to the weight. The first group 300 fish (10-40 gram), the second group 300 fish (more 40-up to 70gram), and third group 300 fish (more 70-up to 125gram). The gills of fish were subjected to clinical, parasitological, mycological and bacteriological examination. The parasitological examination of gills of collected samples revealed that, the prevalence rate of infestation with *Trichodina*, *Dactylogyrus* and *Clinostomum tilapiae* was 7.55%, 38% and 13.22% respectively, while the prevalence rate of saprolegniasis and bacterial gills disease was 5.22% and 3.33% respectively. The main clinical signs showed on gills of infected fish were gills appeared pale colourness, covered with mucous. In some fish gills were congested and swollen while in other destruction of gills lamellae also observed. In cases of infested fish with yellow grub disease, the clinical signs characterized by presences of visible yellow to orange pea-like encysted metacercaria which arranged in grape like structure in branchial cavity and branchiostegal musculature with presences of free living larva. While in saprolegniasis the clinical

signs appeared as cotton like growth, brownish in colour found on different parts of skin, gills and fins. The prevalence rate of *Trichodina* infestation in different weight 10-40gram, more 40-up to70gram and more 70-up to125 gram were 10%, 7% and 6% respectively so that the young fish were more susceptible to take infection than old one. While the prevalence rate of infestation in different seasons winter, spring, summer and autumn were 14.66%, 8.44%, 2.66% and 4.44% respectively. It cleared that the maximum infestation with *Trichodina* occurred in winter. The prevalence rate of *Dactylogyrus* infestation were 46%, 40% and 28% in different weight 10-40gram, more 40-upto70 gram and more 70-up to125gram respectively so that the infestation rate was more in young fish than old. While the seasonal prevalence rate were 36.44%, 35.55%, 47.55% and 32.44 in winter, spring, summer and autumn so that the high infestation with *Dactylogyrus* appeared in summer. The prevalence rate of infestation with *Clinostomum tilapiae* in different weight 10-40gram, more 40-up to70gram and more 70-up to125gram were 14%, 14% and 11% respectively. The percentage of infestation rate in different seasons winter, spring, summer and autumn were 29.33%, 14.66%, 2.66% and 6.22% respectively. The infestation rate with *Clinostomum tilapiae* was higher in winter than other seasons. The result of mycological examination revealed that, the prevalence rate of infection with *Saprolegnia parasitica* were 8%, 4% and 3% in different weight 10-40gram, more 40-up to70gram and more 70-up to125gram respectively so that the young fish more susceptible than old one to take the infection. The maximum infestation rate in winter and spring were 9.77% and 7.55% in contrast with other seasons were 1.33% and 2.22% in summer and autumn. The bacteriological examination cleared that, the prevalence rate of infection with *Flavobacterium branchiophilum* in different weight 10-40gram, more 40-up to70gram and more 70-up to125gram were 5%, 3% and 2%. While the seasonal prevalence rate in winter, spring, summer and autumn were 4.44%, 7.11%, 0.44% and1.33% respectively so that the fish more susceptible to take infection in winter and spring than other seasons. The result of drug sensitivity test the *Flavobacterium branchiophilum* was highly sensitive to erythromycin, nitrofurantoin, oxytetracycline, tetracycline, neomycin, tarivid and rifampecin but resistant to trimethoprim-sulfamethoxazole and amoxicillin.

**Abeer Ezzat Mahmoud Ali, Ph.D., Fish Diseases 2005.**

**Effect of Black Seed (*Nigella sativa*) on the Immune status of Catfish (*Clarias gariepinus*).**

The aim of this study is to investigate the effect of black seed (*Nigella sativa*) on the immune of Nile catfish, *Clarias gariepinus*, evaluate the effect of *Nigella sativa* on the haematological parameters and evaluate the overall effect of *Nigella sativa* as immunostimulant in case of *A. hydrophila* challenge. In this study, fish injected with *Nigella sativa* oil were effectively protected (0% mortality) during challenge with *Aeromonas hydrophila*, in contrast to control and saline- injected groups were mortalities reached 100%. Lower doses of *Nigella sativa* oil (0.05ml / 100 g), however, proved to be safe to fish with no obvious lesions, in contrast to higher doses (0.2 and 0.3ml/ 100g) where liver and other internal organs affection were seen. Injection of *Clarias gariepinus* with lower doses of *Nigella sativa* oil leads to increase in the total numbers of RBCs and WBCs counts, haemoglobin concentration, and PCV values while injection of higher doses causes decrease in them. The mean cell volume (MCV), the mean cell haemoglobin (MCH), the mean cell haemoglobin concentration (MCHC), serum protein (total protein, albumin and globulin), serum electrolytes values and electrophoretic patterns of serum proteins of injected fish were variable along the experiment. The histopathological examination of liver, spleen, and kidney of fish injected with *Nigella sativa* oil revealed that *Nigella sativa* had immunostimulant effects which represented by activation of haemopoietic tissues of the spleen and kidney with proliferation of the melanomacrophage centers

**Mariam Fouad Mansy, Ph. D., Microbiology and Immunology, 2005.**  
**( CHLAMYDIOSIS)**

In this study two groups of ewes were taken the first group was (302) aborted cases and the second control group was (36) clinically healthy ewes. The incidence of abortion in the first group was high in age from up to 3 years to over 5 years (37.6%), while the old age ewes over 6 years the percent of positivists were 23.5% this due to these ewes may be carriers or have latent persistent with intermittent shedding of the organism. Clinically healthy ewes show incidence of infection of (2.7%), data from the clinical history of the first group and the character of lesions in aborted placentas suggest enzootic abortion. Firstly demonstration of the pathogen where made by microscopic examination

of smears made from the endocervical swabs taken from the aborted ewes stained with Giemsa the sensitivity, specificity, positive predictive value, negative predictive value of these tests were (12.5%), (99%), (100%), (76%). Isolation of the pathogen was done through inoculation of the samples into Vero cell line, both elementary and reticulate bodies were detected through staining of infected Vero cells with Gemsa's stain sensitivity, specificity, positive predictive value; negative predictive value was (92.5%), (100%), (100%), (97%). Detection of serum anti Chlamydial IgM by ELISA revealed sensitivity, specificity, positive predictive value, negative predictive value, (97.5%), (99%), (100%), (98%). Identification of isolated antigen (intracytoplasmic pre-nuclear Chlamydial inclusions) on Vero cells was done by IF technique using control positive serum against *Chlamydia psittaci* and antispecies specific fluorescence conjugate; the sensitivity, specificity, positive predictive value, negative predictive value were all (100%).

***Ghada Mohamed Mohamed, Ph.D., Hygiene and Control of Meat, Fish and Their Products and Animal by-products, 2005.***

**Controlling Microbial Contamination of Broilers' Carcasses During Processing in Assiut Students Universities Restaurants.**

150 raw (pre-and post-thawed) and cooked broilers' carcasses were collected during their preparation in Assiut and El-Azhar Universities restaurants to determine the bacterial quality. The values of aerobic plate, psychrotrophs, *Enterobacteriaceae*, coliform and fecal coliform were determined. Neck and vent skin of raw (pre-and post-thawed) and cooked muscle of broilers' carcasses of both restaurants revealed the presence of *Enterobacteriaceae*, *listeria spp.*, *Staphylococci* and *Yersinia enterocolitica* in variant percentages. Neither *Compylocycter* nor *Salmonella* could be recovered from any samples. The bacteriological quality of worker's hands (20), knives (10) and water used before (10) and after thawing (10) of broilers' carcasses in both restaurants were determined. Also the efficiency of acetic, lactic acid (on the broilers' carcasses) and TH<sub>4</sub>, Dialox (on the worker's hands, and knives against 16 bacterial isolates were tested to determine their minimum inhibitory concentrations (MICs) and minimum lethal concentration (MLCs) However the public health importance of the recovered organisms were discussed.

**Gamal Ameen Taher, Ph. D., Parasitology, 2005.**

**Some studies on ecto and endoparasites of camels in Assiut Governorate.**

This study included 174 camels slaughtered at different slaughter houses in Assiut Governorate during the period from February 2003 to January 2004. The study included the prevalence rate, ecological and morphological characters of some ecto and endo parasites in addition to some biological and serological studies on *T.evansi*. Total prevalence rate of parasitic infection was (87.4%). Prevalence rate of infection with *Eimeria* Sp. Was 33.3%. Total prevalence rate of *Sarcocystis cameli*, *T.evansi*, *Theileria camelensis* and gastrointestinal helminths was 36.77%, 6.9%, 8.62% and 77% respectively. Examination of faecal samples, coproculture of positive cases and detection of adult worms. The total incidence rate of fertile hydatid cysts was 61%. The incidence of *Cysticercus dromedarii* and lung worms larvae was 0.57% and 5.74% respectively. Two types of microfilariae were detected namely *D.evansi* and *Setaria equina* microfilariae on *chocerca fasciata* nodules were detected in 8% of slaughtered camels. Three Spp. of ectoparasites were detected 1-ticks 2-*Sarcoptes scabiei* var *cameli*. 3-*C.titillator* larvae Mice and rats were highly susceptible to infection with *T.evansi*. Effect of preservation at low temp. on the viability and infectivity of *T.evansi* and serodiagnostic technique by application of IHA test using locally prepared antigen and comparison of this test with thin blood smear method in diagnosis of trypanosomiasis.

**Wafaa Gaber Mahmoud, M.V.Sc., Anatomy, 2005.**

**Prenatal developmental studies on certain male genital organs of one-humped camel (*Camelus dromedarius*).**

The present study was carried out on 62 fetuses of one-humped camel. The collected specimens ranged from 0.9 to 120 cm CVR length. This study included the development of the gonad as well as the fetal testis and its duct system. The study of the histogenesis of the gonad included its formation, structure, position and relation. Concerning the fetal testis, the present study included its differentiation, shape, position and relation. Concerning the study of the testicular parenchyma, the testicular cords and the interstitial tissue were investigated. The duct system of the testis including rete testis, epididymis and ductus deferens was also studied. The present work indicates that the fetal testis of the camel is poorly developed than other domestic animals.

***Hanan Hassan Abd El-Hafeez, M.V.Sc., Histology, 2005.***

**Histomorphological studies on the testis of donkey during postnatal period.**

The testis of the donkey was completely descended in the scrotum around birth. The mediastinum was located paraxially toward the epididymal border and extended about two thirds of the testicular length. The tubular compartment of the donkey testis showed an increasing volume percentage on the expense of the interstitial tissue during the various postnatal ages. Supporting and germ cells are the main constituents of the seminiferous cords (tubules). The duct system of the donkey testis included an intralobular, mediastinal and tunical segments in addition to efferent ductules. There are two independent Leydig cell cycles during postnatal development. The fetal type Leydig cells and postnatal type Leydig cells.

***Sadek Mohammed Abdulla Al maswary, M.V.Sc., Animal nutrition (poultry nutrition), 2005.***

**Evaluation of some common protein feeds and urea for broilers.**

This work was conducted in two experiments, the first pilot experiment was performed to try to determine the approximate dietary level of urea to be fed that would sufficiently replace part of the diet on the expense of SBOM without adversely effect on the performance. The second experiment to investigate the effect of partially substituting the commonly used SBOM by either 20% full-fat soybean or 20% corn gluten meal of the diet in two trials II and III. From the pilot 1.25% urea replaced part of the ration ( trial IV ), trial I was considered as control. It was concluded that full fat soybean could replace 20% of the basal diet in broilers during the growing and finishing periods, corn gluten meal could replace 20% of the basal diet in broilers during the finishing period, and urea can be added to the diets of broiler chicks at level of 1.25% during growing and finishing periods.

***Doha Yahia Ahmed, M.V.Sc., Forensic Medicine and Toxicology, 2005.***

**Estimation of some metallic pollutants in hair as an indicative tool to their levels in bovine tissues.**

A total number of 50 male cattle (1.9-4 years old) and 50 male buffaloes (1.9-3 years old) were subjected to study. These animals were slaughtered in slaughterhouses belong to Assiut governorate. Digested

samples of whole blood, hair, liver, kidney, muscle and bone were preceded for determination of lead, cadmium and mercury concentration. Thus, metals levels in hair can serve as early warning tool. Correlations between lead concentrations in hair and other investigated tissues in cattle revealed significant positive correlations between lead concentrations of hair and blood ( $p < 0.05$ ), and hair and muscle ( $p < 0.01$ ). On the other hand, buffaloes showed significant positive correlations between lead concentrations in hair and blood ( $p < 0.01$ ), and hair and bone. Correlations between cadmium concentrations in hair and other investigated tissues in cattle revealed significant positive correlations between hair and blood ( $P < 0.01$ ), and hair and liver ( $p < 0.01$ ). On the other hand, Buffaloes showed significant positive correlations between hair and blood ( $p < 0.01$ ), hair and liver ( $p < 0.05$ ), hair and kidney ( $p < 0.05$ ), and hair and muscle ( $p < 0.05$ ). Correlations between mercury concentrations in hair and other investigated tissues in cattle revealed a significant positive correlation between hair and muscle ( $p < 0.01$ ). On the other hand, Buffaloes showed significant positive correlations between hair and blood ( $p < 0.01$ ), hair and kidney ( $p < 0.05$ ), and hair and bone ( $p < 0.05$ ). An overview of the results of the present study showed that there were nine correlations between hair levels of investigated pollutants and their levels in other tissues of buffaloes. On the other hand, only five correlations were recorded in case of cattle.

***Manar Magdy Nemr, M.V.Sc., Microbiology, 2005.***

**Study on incidence of *E.coli* in raw milk and milk products with special reference to the enteropathogenic serotypes.**

150 samples (50 each of raw milk, kariesh cheese and yoghurt) were collected from Assuit City. The samples were examined bacteriologically for isolation, counting and identification of enteropathogenic *E.coli* O<sub>55</sub>, O<sub>111</sub> and O<sub>126</sub> and enterohaemorrhagic *E.coli* O<sub>157</sub>:H<sub>7</sub>. The results revealed that 44%, 24% and 26% of the examined samples of raw milk, kariesh cheese and yoghurt, respectively were contaminated with *E.coli*. In raw milk 36.36% contained  $< 10$  cfu/ml, 36.36% contained 100-1000 cfu/ml and 27.27% contained  $100 \rightarrow 1000$ . In kariesh cheese counted as 16.67%, 33.33% and 50%, respectively however yoghurt counted as 69.23%, 23.08% and 7.69%, respectively. The isolated strains of *E.coli* O<sub>111</sub>, O<sub>55</sub>, O<sub>126</sub> and O<sub>157</sub>:H<sub>7</sub> in raw milk, kariesh cheese and yoghurt were



22.73%, 18.18%, 13.64% and 45.45%, respectively, in kariesh heese 25%, 16.67%, 33.33% and 25%, respectively while in yoghurt 30.77%, 23.08%, 15.38% and 30.77% respectively.

***Maha Ibrahim Hamed, M.V.Sc., Infectious diseases, 2005.***

**Epidemiological studies on infectious skin affections of camels (*Camelus dromedarius*) in Upper Egypt.**

From July 2003 till July 2004, a total number of 2377 camels in different ages and sexes, and in different localities in Upper Egypt (El-Minea, Assiut, Sohage, El-Wady El Gadid, Aswan Governorates and Shalatin city) and in different seasons of the year. Of these camels, 313 cases were found with skin affections. The different skin affections were classified according to the clinical observations and laboratory findings into: mange (4.84%), pseudotuberculosis (2.1%), contagious skin necrosis (1.56%), skin abscesses (1.14%) and tick infestation (5.9%). The highest prevalence of pseudotuberculosis, contagious skin necrosis and skin abscesses was at El-Wady El-Gadid Governorate, while mange and tick infestation was more prevalent at El-Minea and Assiut Governorates respectively. In pseudotuberculosis season has no effect on the occurrence of the disease, meanwhile the other skin diseases were more prevalent in hot months than in hot months. Concerning sex susceptibility, there was no significant difference in the percent of infection between males and females in most skin diseases (non six-linked diseases) except pseudotuberculosis, in which the percent of infection was higher in females than males. The highest percent of infection with most skin diseases was in camels between 9-10 years of age. The susceptibility of camels infected with trypanosomosis to skin diseases higher than healthy camels.

***Noha Hassan Mohamed, M.V.Sc., Zoonoses, 2005.***

**The use of ELISA [Enzyme-linked immosorbent assay] for diagnosis and epidemiology of *Brucella* infection in some farm animals and humans in Assiut Governorate.**

A total number of 197 cattle blood samples were examined serologically. Brucellosis incidence all over Assiut Governorate was 3.5 %. Cattle in slaughter houses have the highest infection rate (7.14 %) followed by cattle in private flocks (1.63 %). A significant correlation between sexually mature animals and the rate of infection was observed. The incidence of brucellosis among cattle varied according to sex from

0.00 % in males to 5.98 % in females. Seroprevalence of brucella infection among 129 sheep blood samples was 11.6 % all over the Governorate. A highest attack rate (50 %) was observed among the age group (2.3- 2.6) years. The incidence of brucella infection was (12.19 %) in ewes while no positive cases were recorded in rams. The prevalence of brucella infection among 107 examined goats was 0.93 % in Assiut Governorate. While, the serological examination of 32 buffaloe' s sera did not detect any positive reactors. The seroprevalence of brucellosis among 127 examined human sera in Assiut Governorate was (32.2 %). An incidence of 40.3%, 18.1 %, 44.4 %, 40 %, 14.2 % and 66.6 % was recorded among farmers, veterinarians, students, children, manual workers and others respectively. A higher brucella prevalence was recorded in men (36.6 %) than in women (26.78 %). The rural population shows a higher infection rate (38.7 %) than the urban one (14.7 %). The infection rate was intensified among the age group less than 16 years (40 %).

***Hussein Awad Hussein, M.V.Sc., Internal Veterinary Medicine, 2005.***  
**Effect of some internal and external parasitic infestation on body condition in cattle with special reference to liver function tests and some trace elements.**

General health performance and body condition of cattle are greatly affected by internal and external parasitic infestation and it is varied with the type and severity of parasitic infestation. Coccidiosis represents a serious problem in calves. Nervous signs due to coccidiosis should not be neglected as a diagnostic signs. Unthriftiness, weakness and emaciation are common clinical findings in external parasites infested cattle. Deteriorated body condition, fever and anorexia are common clinical findings in cattle infested with ticks associated with theileriosis and babesiosis. Impairment of liver functions was commonly seen in cases of ticks associated blood parasites (*Theileria* and *Babesia*), severe *Trichostrongylidae* and mixed internal parasites infested cattle. Internal and external parasitic infestations in cattle are common related with lower serum levels of copper and iron. Trace elements supplementation and liver support medicaments are recommended in positive cases for internal and external parasites infested cattle.

**Tarik Nabil Ahmed, M.V.Sc., Veterinary surgery, 2005.**

**Studies on repair of articular cartilage defects of the humeral head in dogs.**

The present study was carried out on 48 shoulder joints of 24 healthy mature mongrel dogs. The experimental animals were divided into 4 groups each by 6 dogs. An articular cartilage defect was done using 5-mm diameter electric burr. The defect was managed in a special manner in each of the following groups; Group I (Abrasion arthroplasty group) was performed by induction of a superficial intracortical debridement of the Subchondral bone. Non cutting surgical needle was used for induction of deeper lines (4 lines) within the Subchondral bone until bleeding was noticed. Group II (Curettage group) the drilling and curettage was continued into the Subchondral bone for another 4-mm depth. Group III (Forage group) Forage of the Subchondral bone was performed by induction of multiple small holes (4 holes) in the Subchondral bone 3-mm depth using straight non cutting surgical needle, with pointed free end. Suturing of the joint capsule, muscles and skin were done. Control group (Group IV): Arthrotomy was performed without any surgical intervention to the humeral head cartilage. The results were evaluated by clinical examinations, post-mortem findings and histo-pathological changes. Clinical examinations of the 4 groups reveal that there was no much difference between the groups clinically. Most operated dogs were survived the operation without Postoperative complications. There were no any signs of forelimb lameness by the 4th postoperative day. There was no evidence of a tender point in the shoulder region by the 4th postoperative day. Post-mortem and histo-pathological examinations using modified Cook, et al (2003) grading scales were used for evaluation of the results. Group III (forage group) was graded to be the best group in the study while group I (abrasion Arthroplasty) was the worthiest. The grade of group II (curettage group) was better than group I (abrasion arthroplasty) but did not give higher scores like that of forage.

**Waleed Senosy Ali Senosy, M.V.Sc., Theriogenology, 2005.**

**Studies on the cervix of Buffalo in relation to Reproduction.**

Macroscopical characters of the cervix (length, diameter, thickness of the cervical wall,) differed greatly with the stage of estrous cycle. The number of transverse and longitudinal folds in buffalo cervix was 1- 4

and 13 – 32 respectively. The height of transverse rings increased from the uterine transverse ring anteriorly toward the vaginal one posteriorly. Micromorphological characters of the cervix were studied including different tunics of the cervix including the cervical mucosa, lamina propria and tunica muscularis with special reference to its thickness and collagen content that increased in the posterior third of the cervix from the anterior one. Ultrasonographic picture of the cervix was studied in pregnant buffalo cows, cyclic cows and heifers including its depth and echogenicity. The cervix was less hypoechogenic in prupertal heifers, luteal phase of estrous cycle, late gestation period and last month of pregnancy while increased during follicular phase, early and mid gestation period. The cervical depth increased gradually with the advancement of pregnancy that decreased significantly at last month of pregnancy.

**Rania Mohamed Mohamed Ahmed Awada, M.V.Sc., Milk Hygiene, 2005.**

**Survey on the pseudomonas bacteria in milk sold in Assiut City.**

*Pseudomonas* species could be detected in 240 random samples of raw, pasteurized, UHT and flavored UHT milk. *Pseudomonas* species could be detected on CN agar in 55, 41.66, 30 and 6.6% of raw, pasteurized, UHT and flavored UHT milk samples, respectively. While, on CFC agar, *Pseudomonas spp.* could be isolated in 53, 45, 28.3 and 3.3% of the examined milk samples. Also, the characterization of *Pseudomonas spp.* isolated from the examined milk samples for production of extracellular virulence factors as proteolytic and lipolytic enzymes were studied. Out of 174 *Pseudomonas spp.*, 126(70.78) possessed proteolytic activity, while only 105(59%) showed lipolytic activity. In addition, the effects of honey and garlic on survival of *Ps.aeruginosa* were evaluated using different concentrations in yoghurt stored at 4°C. *Ps.aeruginosa* couldn't be detected after 2 days in samples of yoghurt containing honey and garlic, on the other side, *Ps.aeruginosa* failed to be isolated after 4 days of storage from control samples. The public health significance of the organism and the precautions, which should be taken to control this organism in the dairy industry as well as recommended sanitary measures, were also discussed.

collected from different localities in Assiut City. These samples were examined for the prevalence of *P. shigelloides* using 2 selective media: Plesiomonas agar (PL agar) and modified Rimler-Shotts medium. The samples were examined bacteriologically for isolation and identification of *P. shigelloides*. The results revealed that 4 (2.7%), 1 (2%), 3 (6%), 3 (6%) and 2 (4%) of the examined raw milk, Damietta cheese, Kareish cheese, Yoghurt and Ice-cream samples were contaminated with *P. shigelloides* using PL agar, respectively. However, the incidence of *P. shigelloides* on modified Rimler-Shotts medium was 2 (1.3%), 1 (2%), 2 (4%), 1 (2%) and 2 (4%) in the same samples, respectively. However, the incidence of *P. shigelloides* on modified Rimler-Shotts medium was 2 (1.3%), 1 (2%), 2 (4%), 1 (2%) and 2 (4%) in the same samples, respectively. Comparison between Plesiomonas agar (PL agar) and modified Rimler-Shotts medium revealed the superiority of PL agar. Growth and survival of *P. shigelloides* was evaluated in yoghurt which was laboratory prepared, inoculated with the previously isolated and identified *P. shigelloides* to yield a concentration of  $3 \times 10^9$  cfu/g. *P. shigelloides* count and pH value were determined daily, where the count decreased to reach  $7 \times 10^3$  cfu/g with decrease of pH to reach 3.6 by the end of the 7<sup>th</sup> day of storage.

**Manal Mohamed Amin, M.V.Sc., Milk Hygiene, 2005.**

#### **Microbiological evaluation of ice cream mix powder sold in Assiut City.**

No provability is needed to state that ice cream is the most widely distribution dairy food. Ice cream is considered a safe, enjoyable, energy giving and refreshing food because levels of water soluble vitamins and minerals are two to three times higher than those of full cream milk. As the microbial quality of ice cream mix powder with various flavoring agents, reflects the care with which milk was produced and the sanitary condition prevailing during its manufactures therefore, this work was planned to secure information regarding its microbiological status by the following: Aerobic plate count, the data recorded that the highest contamination 82.7% of ice cream mix powder samples contained aerobic bacteria with an average value of  $2.5 \times 10^2$ /g. Then 81.3% of the examined samples contained yeast and mold with an average value of  $57.435 \times 10^2$ /g, while 80% of the examined samples contained thermoduric bacteria with an average value  $1.14 \times 10^2$ /g. Anaerobic bacteria due to poor hygienic measures so 40.7% of the examined

samples contained anaerobic bacteria, while, isolation of Enterobacteriaceae, psychrotrophic, *B.cereus*, *Staph. aureus*, *Enterococci*, coliforms and fecal coliforms with 38.7, 31.33, 14.77, 12, 10.7, 5.33%, respectively. Generally these results reflect quality of product, which produced under strict hygienic measures during packaging processing storing period and efficiency of pasteurization to reach to consumer.

***Mohammed Ali Abdel-Ghani, M.V.Sc., Theriogenology, 2005.***

**Use of real-time ultrasonography for diagnosis of infertility in Egyptian native Cattle and Buffaloes.**

This study aimed to describe the echogenic pictures of the most common pathological ovarian structures and to characterize the echogenic characters of various pathological conditions of the uterus and to record the incidence of the most common pathological disorders of the reproductive tract in both native cows and buffaloes. The normal ovarian structures and normal uterine findings were firstly identified by the ultrasound to acquire good practice for diagnosis of any infertility problem. In this study, the ultrasonographical examination was carried out on slaughtered female genitalia and living animals. The slaughtered female genitalia were collected from local slaughterhouse, near Assiut Governorate (Buffaloes, n=214 and native cows, n=116). The living animals included a 238 buffalo-cows which hospitalized for gynaecological examination in Veterinary Medical Teaching Hospital, faculty of Vet. Farm, Med., Assiut University as well as a 154 native cows housed in the Military Assiut governorate. The slaughtered house materials and living animals were carefully examined for detection of normal and abnormal ovarian, uterine and vaginal findings.

***Ghada Sharaf El-deen Abdel-Raheem, M.V.Sc., Animal nutrition and clinical nutrition, 2005.***

**Effect of some feeding programs on performance, body composition and meat quality in broilers.**

Two experiments were performed to study the effect of restriction of either energy – protein or feed intake or fish meal on broiler performance, carcass traits and meat quality. In experiment I, feeding energy – protein restricted refeed diets (3050 kcal/kg ME&19%cp; 2900 kcal/kg ME&18%cp) through growing-finishing period have an adverse effect on performance. Chickens subjected to grower-finisher feed restriction of 80% & 70% of the ad-libitum intake and realimentation

had similar feed conversions to control and a beneficial effect in reducing abdominal fat pad contents. Broilers fed on 80% of the ad-libitum intake had final body weight better than 70% where had a final body weight similar to control one. In experiment II, feeding 4% fish meal during only starting - growing periods and using 3% fish meal during all phases (starter, grower and finisher) gave best results in weight gain and feed restriction.

*Dena Ez Eldeen Sayed, M.V.Sc., Animal Pathology, 2005.*

**Role of Antioxidants in controlling lead reproductive toxicity in Rats: Clinical and histopathological studies.**

Our study focused on the effect of lead toxicity and its counteraction by treatment with the antioxidant (Antox) on female and male genital system, 50 rats at age of weaning used. After two months of treatment, all rats slaughtered and examined grossly. Samples for histopathological examination obtained. Lead toxicity delayed the day of vaginal opening, affected the ovarian follicles and the female genital tract. Lead toxicity induced necrobiotic changes of primordial, primary, secondary and vesicular follicles. In mature follicles (only 16.7 % was affected). Lead toxicity induced focal metaplasia of fallopian tube, uterine glands, cervix and vagina with presence of intra-nuclear inclusion bodies. Lead toxicity affected the testes as it decreased the number of all cells of the spermatogenic cell cycle. Antioxidant protected both female and male genital system from the effect of lead toxicity.

trachea were encountered. On the other hand, 3<sup>rd</sup> stage larvae of *Cooperia punctata*, *Oesophgostomum radiatum*, *Bunostomum*, *Trichostrongylus sp.*, *Dictyocaulus filarial*, *Protostongylus sp.*, and 2<sup>nd</sup> stage larvae of *Skrjabinocaulus sp.*, together with 1<sup>st</sup> stage larvae of *Strongyloides Papillosus*. The second part of this work, eggs of *Ascrdia galli* were cultured at room temperature. Embryonation of eggs started to occur on the third day. Complete embryonation with the development of larvae within egg's shell occurred on the 16<sup>th</sup> day. Second stage larvae were obtained by the use of magnetic stirrer for 25 minutes. Experimental trial was done with embryonated eggs of *Ascaridia galli*. The work succeeded in inducing pathological features indicating larval invasion in the intestine, liver and lung while cross sections in the larval stage were seen in lungs of animals killed 10 days post-infection.

**Huda Mohammed Mohammed, M.V.Sc., Parasitology, 2005.**

**Parasitological and serological studies on *Sarcocystis* species of cattle in Assiut.**

Different species of *Sarcocystis* of cattle were studied in Assiut. Samples from the heart, oesophagus, diaphragm and ocular muscles were examined. In addition, blood samples were collected from 100 animal slaughtered in Assiut city abattoir. Studies on *Sarcocystis* infection in cattle showed that the total infection rate was found to be 94% by light microscope examination and 98% serologically by enzyme linked immunosorbent assay (ELISA). The infection rate in different organs was 89% in ocular muscles, 84% in oesophageal muscles, 51% in heart muscles and 30% in diaphragmatic muscles. Ultrastructure studies of *Sarcocystis* species of cattle with transmission electron microscope revealed the presence of four species. The first one was *Sarcocystis cruzi* which characterized by thin wall with hair like villar protrusions. The second species was *Sarcocystis hirsuta* that provided with club or bulb like villar protrusions with tapered tips. The third species was *Sarcocystis hominis* with cylindrical (finger like) villar protrusions with broad tips. The fourth species was *Sarcocystis fusiformis* like cyst which has highly branched villar protrusions with constricted base. This is the first time of discription of this species in cattle. Experimental infection revealed that only the dogs complete the cycle of *Sarcocystis cruzi*.



**Horya Galal Abd El-Hameid, M.V.Sc., Milk Hygiene, 2005.**

**Prevalence of Klebsiella Species in Milk and Some Milk Products in Assiut Governorate.**

A total of 300 random samples of raw milk and milk products including, 150 raw milk samples, Kareish and Damietta cheese and ice cream (50 samples of each) were collected from different localities in Assiut Governorate. The samples were examined bacteriologically for enumeration, isolation and identification of Klebsiella species using two media. The obtained results revealed that the count of Klebsiella ranged with averages of  $3.3 \times 10^3$ ,  $7.2 \times 10^3$  and  $1.2 \times 10^4$  in dairy farms, dairy shops and street vendors raw milk samples, respectively on MCIC agar. While, on EMP agar with averages of  $1.3 \times 10^3$  and  $5.6 \times 10^3$  in dairy shops and street vendors milk samples, respectively. In Damietta cheese with averages of  $1.3 \times 10^3$  and  $4.5 \times 10^2$  on MCIC agar and EMB agar, respectively. While, in Kareish cheese with of averages of  $2.7 \times 10^3$  and  $8.5 \times 10^2$  on MCIC and EMB agar, respectively. Klebsiellae could not be detected in small scale producers ice-cream on MCIC and EMB agar. While, the count in street vendors ice cream with averages of  $4.1 \times 10^3$  and  $1.7 \times 10^3$  on the two media used, respectively. The obtained results revealed that 15 (10%), 3 (6%), 6(12%), 3(6%) of the examined raw milk, Damietta and Kareish cheese, and ice cream samples were contaminated with Klebsiella spp. on MCIC agar. However, the incidence of Klebsiella spp. on EMB agar was 12 (8%) in raw milk samples, 2 (4%) in Damietta cheese, 5(10%) in Kareish cheese and 2 (4%) in ice-cream. The isolated species were *Klebsiella pneumoniae*, *K.rhinoscleromatis*, *K.planticola*, *K.ozaenae*, and *K.ornithinolytica*. Comparison between MCIC and EMB agar revealed that the use of MCIC agar is the most selective medium for isolation of Klebsiella spp. due to Carbenicillin which is similar to Penicillin in its action. The antibiogram of *K.pneumoniae* isolated from milk and milk products revealed its sensitivity to Cephalosporine, Florfenicol, Oxalinic acid and Pefloxacin with resistance to other antibiotics.

**Mary Refaat Hafez Iskander, M.V.Sc., Milk Hygiene, 2005.**

**Incidence of plesiomonas shigelloides in milk and some dairy products in Assiut city.**

A total of 350 random samples of milk and some milk products including raw milk (150), soft cheeses (Damietta and Kareish cheese, 50 samples of each), yoghurt and ice-cream (50 samples of each) were

**Amany Ibrahim Ali, M.V.Sc., Microbiology, 2005.**

## **Bacterial and mycotic studies on subclinical mastitis in dairy cows in**

### **Assiut Governorate.**

Subclinical mastitis is more important than clinical one because it acts as a source of infection for the rest of animals. A total of 200 normal milk samples were collected from 200 apparently healthy cows. The positive microbiologically examined samples whether bacteria, yeast or fungi were 135 out of 200 milk samples. Accordingly the incidence of subclinical mastitis was 67.5%. Microbiological examination revealed isolation of 159 isolates, of them 177 (73.6%) bacterial isolates, 22 (13.8%) yeast isolates and finally 20 (12.6%) fungal isolates. The most predominant bacterial species was *coagulase-negative staphylococci* (40) with incidence of 34.1%. *Staph. aureus* was isolated from 30 samples (25.6%). Coliform bacilli including *E.coli*, *Citrobacter freundii* and *Klebsiella* incidence were 12.8%, 5.1% and 7.7% respectively. *Strept. agalactiae* and *Strept. dysagalactiae* with an incidence of 5.1% and 3.4% respectively. *Coryne. bovis* with an incidence of (3.4%). The incidence of *Pseudomonas spp.* was 1.7% *Proteus mirabilis* was 0.9%. The most prevalent yeast species was *Candida albicans* (5.0%), followed by *C.guilliermondii* (3.7%) and *C.parasillosis* (2.9%). The others were *C.pseudotropicalis* (1.5%) *C.krusei* (1.5%) and *Torulopsis spp.* (1.5%). The isolated mould species were *Aspergillus fumigatus* (8.9%) and *Aspergillus niger* (5.9%). 52 bacterial strains were tested for their in vitro susceptibility to different antibiotics, it was obvious that amikacin was the most effective antibiotic following it gentamicin and chloramphenicol.

**Alaa Sayed Abou-Elhamed, M.V.Sc., Anatomy and Histology, 2005.**

### **Morphological studies on the accessory genital glands of donkey "Equus Asinus" in different seasons.**

The present study was carried out on 32 sexually mature apparently healthy male donkeys (Jacks) ranging from 5 to 9 years to investigate their accessory genital glands morphologically, morphometrically and histochemically during the different seasons of the year, in addition to scanning electron microscopy of the shape of the glandular duct openings. The accessory genital glands of the donkey consisted of the paired ampullae of the deferent duct, the paired seminal vesicles, the prostate, and the paired bulbourethral glands, in addition to the urethral

and this activity decreased gradually during summer autumn to reach its minimal level during winter. Scanning electron microscopy revealed that

the prostatic gland duct openings were dome shaped, while that of the bulbourethral glands appeared as elevated papillae. The urethral glands duct openings were either oval, rounded or ovoid in shape. In the prostatic portion the surface epithelium was characterized by convex apical cell surface, while at the prostatic portion it was flattened with hexagonal shaped luminal surface with numerous ill-developed microvilli.

***Manal Abdalla Mohammed, M.V.Sc., Animal and poultry hygiene, 2005.***

**Environment pollution and its role in calf diarrhea in dairy farms.**

A bacteriological study was carried out on three dairy farms to detect the possible role of both dams and surrounding environment in the incidence of calf diarrhoea. A total of 366 samples were collected from faecal matter of calves and dairy cows, teat apices of dairy cows as well as air, water and soil samples from both calf and dairy cow houses. It was noticed that the most common microorganisms responsible for neonatal calf diarrhoea isolated from faeces of diarrhoeic calves were *E.coli* and *Clostridium perfringens*. The present study pointed out that there is a positive correlation between percentages of microorganisms isolated from faecal samples of calves and those isolated from faecal and teat samples of dairy dams. Moreover, this correlation sweeps to air, water and soil samples from the surrounding environment. In addition, a positive correlation was found between percentages of microorganisms isolated from teat apices and air, water and soil samples of dairy cow byres. The effectiveness of the prevailing temperature and relative humidity on the bacterial flora was clarified.

***Wafaa Gamal El-Deen Mohamed, M.V.Sc., Parasitology, 2005.***

**Studies on some soil transmitted nematodes of Ruminants and chicken.**

In the present study, one hundred soil samples were collected for studying its role in transmission of nematode stages (eggs and larvae) to domestic animals and birds (forty soil samples were collected from around farm stables, 10 from around poultry farms and 50 from around farmer houses). They were examined by centrifugation technique for eggs and Bearmann technique for larvae. Eggs of *Neoascaris vitelorum*, *Bunostomun sp.*, *Oesophagostomum sp.*, *Ascaridia galli*, and *Syngamus*