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# THE PHOTOPERIODIC AND HORMONAL REGULATION OF REPRODUCTION IN THE PIGEON *Columba livia domestica*

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***Abstract :*** *Basic objective of this research was to ascertain the effect of long photoperiodic (18L:6D) and the treatment prolactin concentration of 10 and 20 ng / ml / of bird / 3 days in the breeding pigeons (Columba livia domestica), and the level of concentration of prolactin and thyroxin and testosterone, proteins and sugars in the plasma male domestic pigeon. Where the results obtained showed that along the reproductive or sexual activity, from 5 to 6 weeks in the photoperiodic long (18L: 6D), for the control lost sight (blind)of, either the treatment focus yen different prolactin 10 ng / ml / of a bird / 3 days has a significant impact on the lower ($P < 0.05$) the growth of male sex glands while treatment concentration 20 ng / ml / of a bird / 3 days of prolactin keep birds treatment in the dormant days for the duration of sexual experience It also demonstrated the importance of the results of research for the article analyses hormonal male blood plasma in the pigeon, there are very low or mental function ($P<0.01$) in the decrease of concentration in plasma prolactin bird, a blind and control in week 4 and 8 compared treated of 10 and 20 ng / ml / of a bird / 3 days as for the plasma concentration thyroxin when male pigeon, the control, a lost sight is very important to the stability of the opposite treatment of two different doses 10 and 20 ng / ml / of a bird / 3 days are lower ($P <0.01$) in focus throughout the day experiment as for the concentration of protein and hormone testosterone are rising significant ($P <0.05$) in concentration during the week 6 and 8 for the control and lost sight, as stability in the glucose concentration within weeks only at the beginning of the experiment was high when brigades lost sight, treated of 20 ng / ml / of a bird / 3 days.*

***Key words:*** *Reproduction- Prolactin- Thyroxin- Photopériod- Birds.*

## INTRODUCTION

Reproduction for each physiological mechanism of living organisms to produce new members, thus maintaining the continuity of nature, the mismatch of the limited period of reproduction for certain seasons of the year, where the latter is the same every year periodic, as is the case when many species of birds, especially those living areas of the quarterly differential. The breeding of birds, where features quarterly sexual activity during a certain part of the annual session beginning in the spring in response to certain environmental factors: temperature, food availability, particularly to increase the length of the photopériod (Rowan, 1925; Bissonnette, 1931). To stop reproduction with the onset of summer, despite the continuation of the photopériod length of time, known in this period of sexual inactivity (refractory phase) (Farner *et al*., 1988).

The extent of the sensitivity of any bird to measure the photoperiod term depends essentially on the assumption that the bird on the hour containing biological synthetic hourly similar, if more than 12 hours duration the photoperiod, it was found that the birds of the day is long and thus the response gonad sexual (testis) growth (Follett and Robinson, 1980). Results showed that at the early stage of mammalian reproduction is used at the same time, the sight through the eyes and pineal gland hormone, which could see secretion melatonin and at the reception and conversion of the optical index., (Foster *et al.*, 1989).as observed when exposing the rats full of sexual activity for a long photopériod and blind, the volume of declining sexual gonad (Reiter, 1978). This confirms that the optical receptors in the eye are a responsibility on the alarm and the start of sexual activity (Groos, 1982). On the contrary, when the birds, the transformation of the index from the optical path of light receptors is outside the iris and pineal gland outside, but the eradication of pine gland does not have an impact on the natural growth of the glands (Nicholls *et al.*, 1988). and the basis of this information has shown the results of studies conducted on a large number of birds that the gradual increase in the length of the photopériod results to alert the discharge area under the bed, nervous hypothalamus for the secretion of hormonal factors flow GnRH (gonatropin-releasing hormone) which alerts the pituitary gland secretion of hormones FSH (Follicle-stimulating Hormone) and (Luteinizing hormone) LH which in turn affect the level of sexual and endocrine secretion of hormones and sexual the birds enter the phase of reproduction (Sharp and Dawson. 1998).

Can be modified to proliferative activity and thus a disincentive birds lose the ability to respond to the optical factor, which decreases the volume of sexual glands and less discharge axis and increased proliferative hormone prolactin concentration in plasma coincided with the replacement of feathers as defined in this phase of sexual inactivity (Woitkewitsch, 1940) Research has shown the importance of the thyroid gland in the control of sexual activity at the many types of birds, where tests showed that the eradication of the thyroid gland before the start of reproduction of some species of birds to prevent or discourage sexual glands reduced without affecting the rate of growth and activity, when exposed for a period of light long, while the sexual activity is dependent upon thyroid birds sound signal to enter a period of sexual inactivity (Goldsmith and Nicholls, 1984b; Dawson, 1993) in the light of the findings of the research in the field of reproductive physiology quarterly, it was found that the treatment of birds, starlings thyroidectomy doses from different Thyroxin restore the hormone responsiveness of these birds is that the intervention of the optical phase of sexual inactivity in the same period of time the duration of the thyroid gland healthy birds (Goldsmith *et al*., 1989).

During the research carried out under either natural or laboratory conditions and the importance of the hormone prolactin in the control of breeding of birds, where the increase in the concentration of the hormone prolactin are reduced before and during the sexual glands (Haase *et al*., 1985 and Mauro *et al*., 1989).

The other hand, the increase in the concentration of prolactin at the bird feeding has reflected negatively on the level of the pituitary gland, which inhibits the secretion of hormones, sex glands and feeding of FSH and LH, and the treatment of influenza by the hormone prolactin usually leads to a decrease in concentration of the hormone LH in the plasma and thus stop the process of formation of sperm, causing reduce the size of male sexual glands and fertility delay for birds exposed to long periods of light (Buntin *et al*., 1987; El-Halawani *et al*., 1991) In spite of this, all studies have shown that the hormone prolactin treatment is an indirect cause for sexual inactivity (Goldsmith & Nicholls, 1984e)**.**to break the phase of sexual inactivity, and the restoration of the ability of birds to respond to a required optical exposing birds sexually inactive for a period of light is less than 12 hours a day (Farner *et al*., 1988).

This is known as a recovery phase sensitivity, which is in direct proportion to the rate of completion for the length of the photoperiod short-term, is limit the length of the day whenever words doubled the time needed for the restoration of sensitivity (Boulakoud *et al*., 1991).On this basis, the aim of conducting this search, an attempt to examine the importance of the impact of prolactin hormone in the birds exposed to the light system has a long (18D: 6D) and lost sight (blind) of the birds and the different treatment of the yen, the focus of the hormone prolactin 10 and 20 ng / ml / of a bird / 3 days On the other hand, know how the importance of the impact of these concentrated on the rate of growth of male sex gland and some of the concentrated Biochemistry and hormonal: protein, glucose, Testosterone and prolactin and thyroxin, where pigeons *Columba livia* action for the duration of the experiment.

## MATERIALS AND METHODS

20 male pigeons of local population of *Columba livia* strain, aged 10 months old, and weighted 346±50 g were divided into equal 4 groups, and placed in cages of 4 dimensions (60 × 54 × 52) $cm^3$ were presented for the photopériod (18L: 6D), after the adjustment process, which lasted 15 days in laboratory conditions, temperature (21 ± 1 C °) and percentage of moisture (70-75%) and they have free access to water and food ad libitum. Animals were put in the animal house (Department of Biology, university of Annaba) of these birds were divided into 4 groups as witness the first batch second batch got through the eyes of needles and the third group treated with hormone prolactin concentration of 10ng / ml / of a bird / 3 days and the fourth group treated with a concentration 20 ng / ml / of a bird / 3 full days during the days of the experiment and Table 1 represents the planned distribution of the groups.

**Table 1:** Planned Distribution of the Groups

| Groups | Treatment | | |
|---|---|---|---|
| | **Photopériod** | **Hormone Prolactin Concentration** | **lost sight (Blind)** |
| Control (n =5) | 18L: 6D | 0ng / ml / of bird / 3 days | - |
| blind (n =5) | 18L: 6D | 0ng / ml / of bird / 3 days | + (yes) |
| 10ng / ml(n =5) | 18L: 6D | 10ng / ml / of bird / 3 days | - |
| 20ng / ml(n =5) | 18L: 6D | 20ng / ml / of bird / 3 days | - |

### 2.1. The process of dissecting the birds and the measurement of the testis volume:

The process of dissecting the birds and the measurement of the volume of male sexual glands are all 10 days: The method of measuring male sex glands undergo an autopsy on the birds over the left thigh muscle and the involvement of another husband, proves the bird on your autopsy by bands at the level of wing and legs to minimize movement during the autopsy to avoid of a hemorrhage after being disposed of by a feather cotton wet with alcohol and then placed the medical ointment for local anesthesia, dig a hole (2 cm) by using a pair of tongs and a sharp look on the sexual glands and the taking of measuring (the length of, the) 0.5 mm to be brought through the process of comparison with the sizes of these glands on paper millimeter (Boulakoud *et al*., 1991). Volume is calculated at the male sex glands, most of the bird by the following law:

Testicular volume was calculated as:

$\upsilon = 4/3\pi a^2 b$ where

$\pi = 3.14$

a: is half the long axis(mm).

b: is half the width(mm).

### 2.2. Blood Sampling:

Are each 10 days, withdrawn from all birds 2 ml of blood in the pipes clarified esters containing sodium concentration of 3% or the Secretary of Fluids bilateral quad anhydride acid (EDTA) Ethylene Diamine Tetra Acetic Acid anti-clot, where he works to maintain the cellular components of the damage, then take these samples to a centrifuge where it be for a period of 20 minutes at speeds of rotation of 4000 cycles / minute and kept in a refrigerator at a temperature of (-20 ° C).

### 2.3. Analysis parameters of blood:

- Analysis of the hormone prolactin is thyroxin and calibration of radiation through the hormonal (Radio-immunology) IRA.
- Analysis biochemical for the way proteins were Spectrophotométrique of Biuret (Biuret et al., 1974).
- Analysis biochemical for glucose was through the technical Trinder (Trinder, 1969).
- Analysis n biochemical for testosterone was way immunoenzymatique-colorimé-trique.

## STATISTICAL ANALYSIS

Has been carried out by student *t*-test to compare between paired groups, whereas the one way analysis of variance (ANOVA) was used to compare between the fourth groups.

## RESULTS

### 1. Testicular Volume (Fig. 1):

Changes in the testicular volume of male pigeon , shown on the figures 1, showed the results obtained in the presence of a full reproductive cycle when birds groups control and blind, where recorded a noticeable growth in the means volume of male sex glands(628,88 ± 135,49mm3and 707,26± 260,47mm3); (* P <0.05) during the 4 weeks of the experiment, compared the two groups treated 10 and 20 ng / ml / of a bird / 3 days of prolactin , with an mean sexual glands (603,11± 230,47mm 3 and 440,57± 145,26mm 3) .

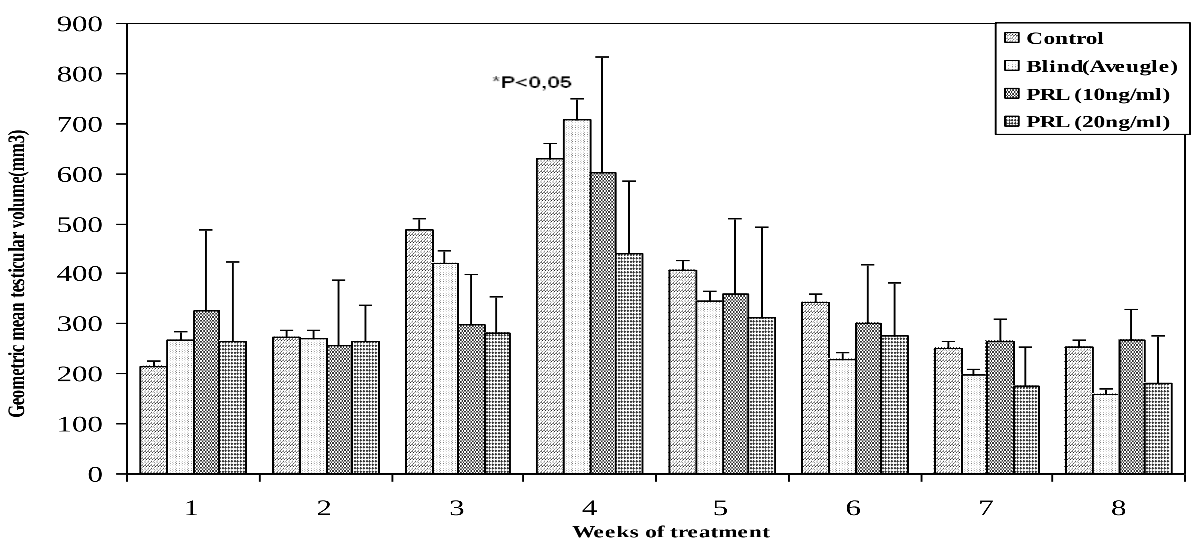


Figure 1**:** Change in testicular volume ($mm^3$) in male pigeons treated at two different doses of prolactin (10 and 20 ng / ml / of a bird / 3 days) subject to a long photoperiod (18L: 6D) Data are expressed as means ± SD (n =20). In each date, different letters above bars indicate significant differences at $p < 0.05$ and $p < 0.01$ (ANOVA followed by Student's t test).

**2. Plasma Testosterone (Fig. 2):**

The highest mean plasma testosterone concentration when were two groups control and Blind (* P <0.05) especially in Week 6, as compared two groups treated 10 and 20 ng / ml / of a bird / 3 days where he scored a very low significantly(** P <0.01) in the concentration of testosterone, On the other hand noted the increase is close to the mean concentration of testosterone in birds group Blind compared to the control, during the week 8, as well as the observed decrease in mean concentration is close to the group at the testosterone concentrations of group treated 20 ng / ml / of a bird / 3 days compared to concentration of group treated 10 ng / ml / of a bird / 3 days according to Figure 2.

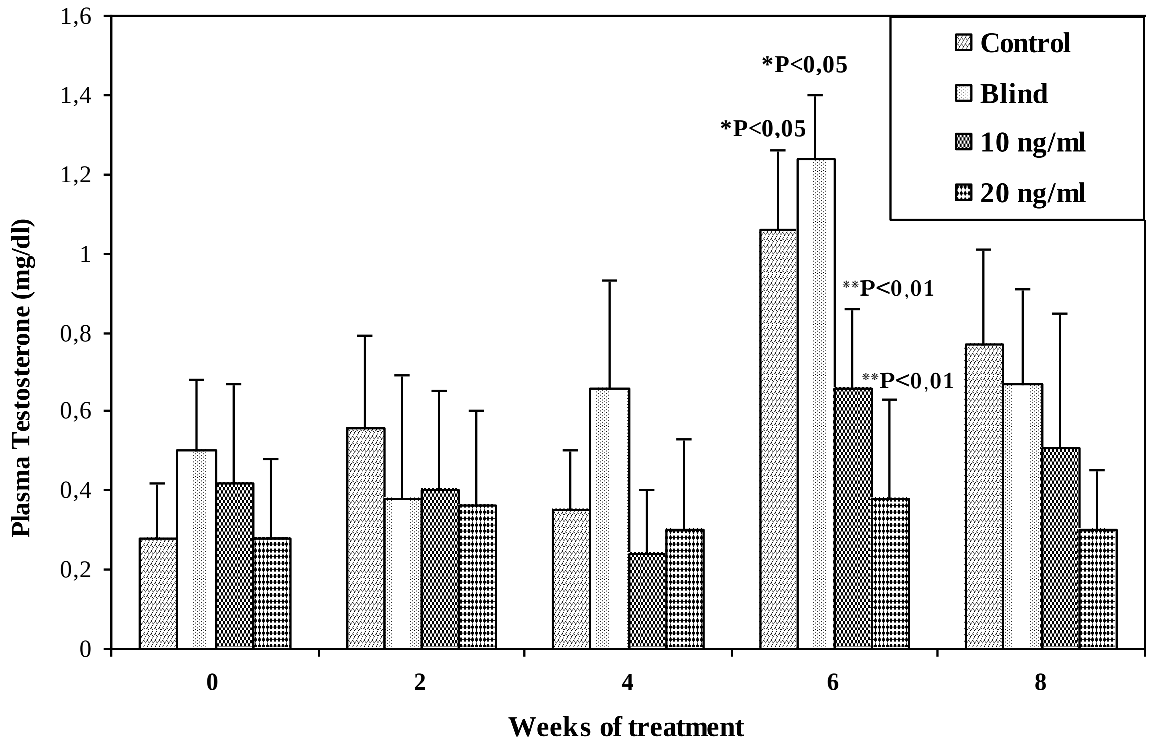


Figure 2: Change in plasma testosterone (mg/dl) in male pigeons treated at two different doses of prolactin (10 and 20 ng / ml / of a bird / 3 days) subject to a long photoperiod (18L: 6D) Data are expressed as means ± SD (n =20). In each date, different letters above bars indicate significant differences at p < 0.05 and p < 0.01 (ANOVA followed by Student's t test).

**3. Plasma Thyroxin $T_4$ (Fig. 3):**

Illustrated in Figure (3) the change in the means concentration of the hormone thyroxin at the pigeons and the results showed the beginning of the experiment until the end, decrease very significantly the mean concentration of birds at thyroxin group of the blind in the weeks 2, 4 and 6 As well as the eighth week (** P <0.01) compared to an mean concentration of birds at thyroxin two groups treated of concentration 10 and 20 ng / ml / of a bird / 3 days of prolactin.

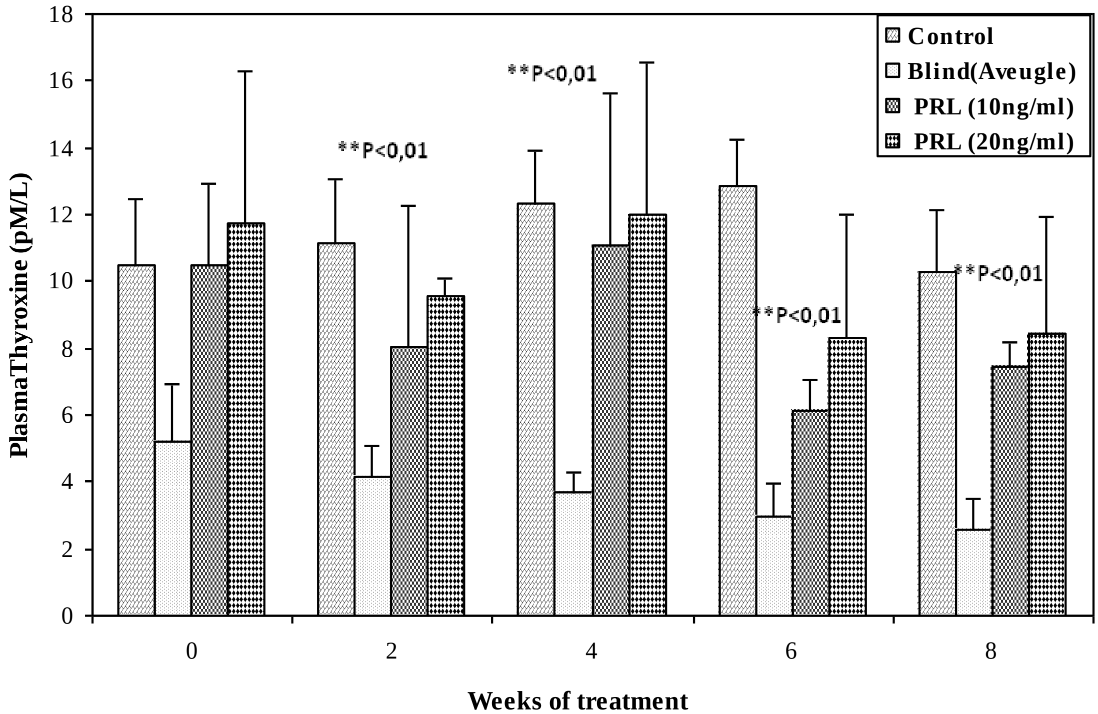


Figure 3: Change in plasma thyroxin (pM/L) in male pigeons treated at two different doses of prolactin (10 and 20 ng / ml / of a bird / 3 days) subject to a long photoperiod (18L: 6D) Data are expressed as means ± SD (n =20). In each date, different letters above bars indicate significant differences at $p < 0.05$ and $p < 0.01$ (ANOVA followed by Student's t test).

**4. Plasma Prolactin (Fig. 4)**

Illustrated in Figure 4 change in the means concentration of prolactin in pigeons was a decrease in legal entity in the means concentration of prolactin when two groups treated of concentration 10 and 20 ng / ml / of a bird / 3 days of prolactin and this during the eighth weeks of the experiment. while members of the group of the control and blind decrease very significantly the mean concentration of the hormone prolactin (** P <0.01) This is the fourth week compared two groups treated of concentration 10 and 20 ng / ml / of a bird / 3 days of prolactin.

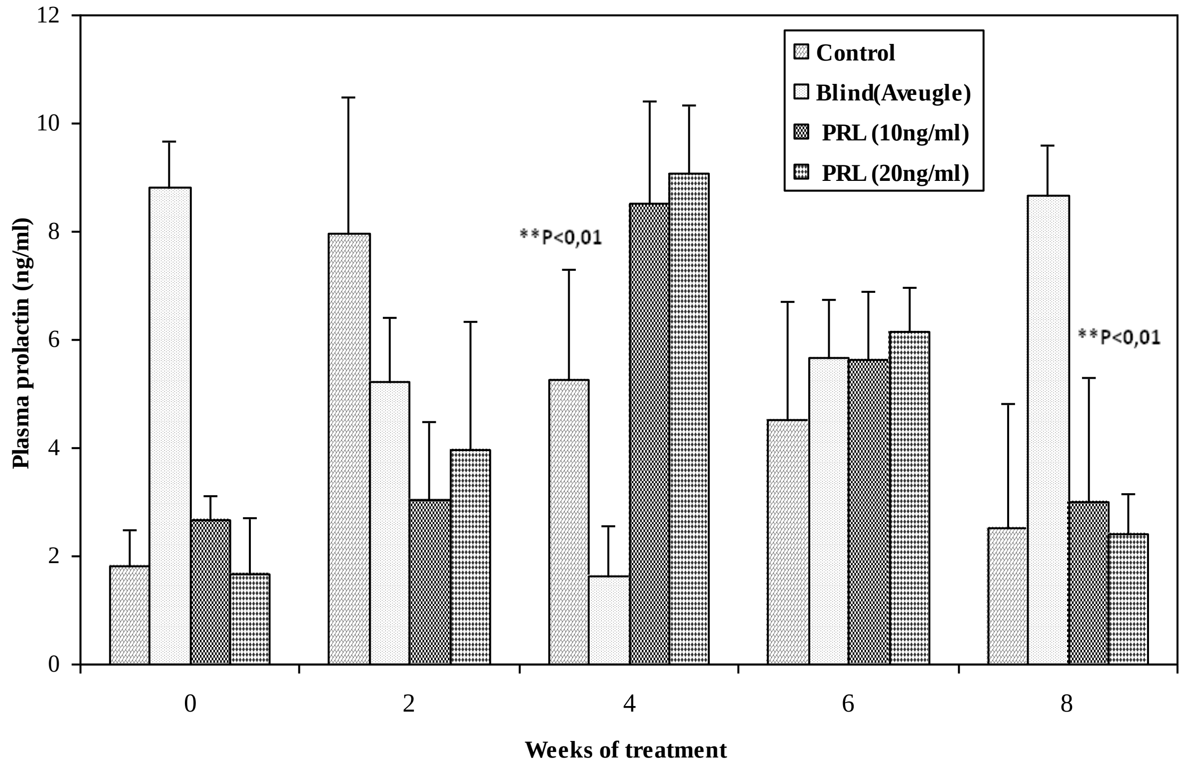


Figure 4: Change in plasma prolactin (ng/ml) in male pigeons treated at two different doses of prolactin (10 and 20 ng / ml / of a bird / 3 days) subject to a long photoperiod (18L: 6D) Data are expressed as means ± SD (n =20). In each date, different letters above bars indicate significant differences at p < 0.05 and p < 0.01 (ANOVA followed by Student's t test).

**5. Plasma Protein (Fig. 5)**

Illustrated in Figure 5 the change in the mean concentration of proteins at the male pigeons and the results showed that between the beginning of the experiment until the end, a relatively high mean concentration of proteins at each of the groups, but the increase was registered when the group very significantly control and the blind in the mean concentration of proteins (** P <0.01) compared of two groups treated of concentration 10 and 20 ng / ml / of a bird / 3 days of prolactin, and this during the sixth and eighth week.

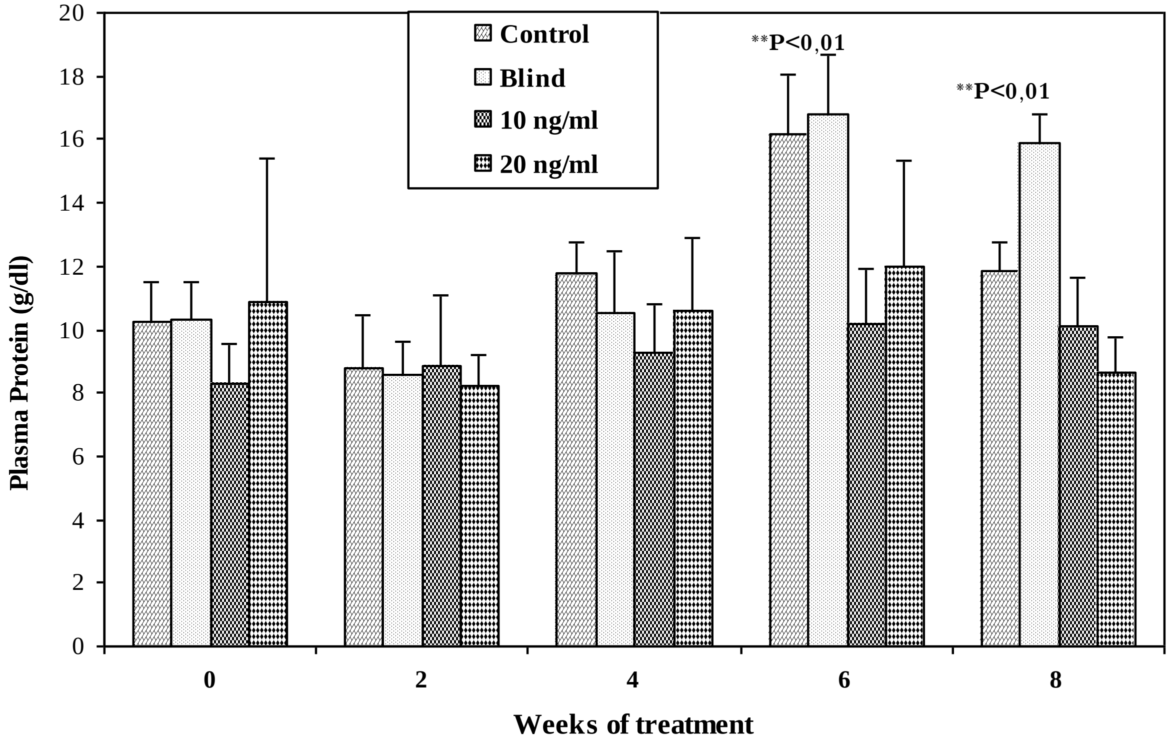


Figure 5: Change in plasma protein (g/dl) in male pigeons treated at two different doses of prolactin (10 and 20 ng / ml / of a bird / 3 days) subject to a long photoperiod (18L: 6D) Data are expressed as means ± SD (n =20). In each date, different letters above bars indicate significant differences at $p < 0.05$ and $p < 0.01$ (ANOVA followed by Student's t test).

**6. Plasma glucose (Fig. 6)**

Figure 6 change in mean glucose concentration when pigeons have been observed at the beginning of the experiment high significantly (* $P < 0.05$) in all cohorts, especially when two groups blind and group treated concentrations of 20 ng / ml / of a bird / 3 days of prolactin . while there are record decrease very significantly the mean concentration of glucose at the birds of the control and the group blind (* $P < 0.05$) concentration compared two groups treated of concentration 10 and 20 ng / ml / of a bird / 3 days of prolactin and that during the fourth week to score significantly decreased (* $P < 0.05$) at all groups in the sixth week.

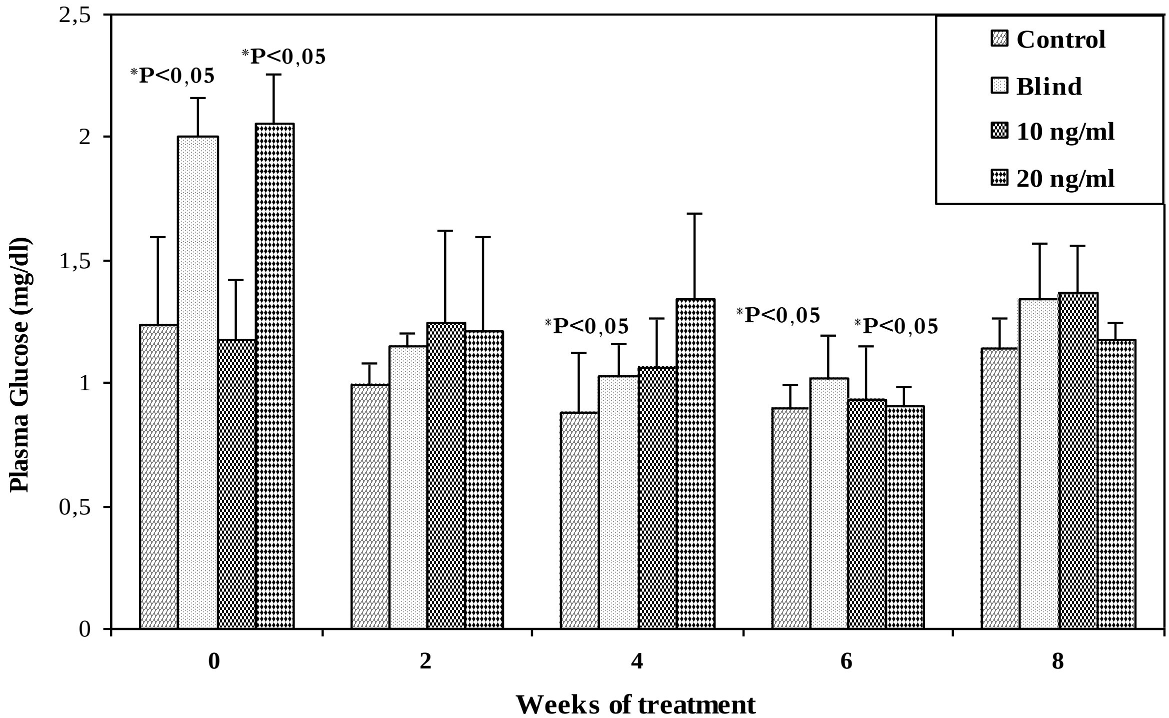


Figure 6: Change in plasma glucose (mg/dl) in male pigeons treated at two different doses of prolactin (10 and 20 ng / ml / of a bird / 3 days) subject to a long photoperiod (18L: 6D) Data are expressed as means ± SD (n =20). In each date, different letters above bars indicate significant differences at $p < 0.05$ and $p < 0.01$ (ANOVA followed by Student's t test).

## DISCUSSIONS

Indicate the results obtained through this study that it is possible to enter the alert stage of the breeding pigeons by the increase in the length of the photopériod daily. The passage of the control and members of the group blind full reproductive cycle by taking into account the change in the volume as an indicator of testicular, where it is estimated the period of sexual activity when pigeons between 4 and 6 weeks under a light (14L: 10D) while the period of sexual activity of 5 - 6 weeks in the photopériod (18L: 6D), (Lechekhab, 1997).

These observations suggest that, under the optical conditions (long day) can be alerted when the end of breeding pigeons in the early times of (about 3 months) compared to the length of sexual activity at this bird at the natural conditions, which take 6 months (Nicholls *et al*., 1988). Studies have shown that have been made to many groups of birds *Sturnus vulgaris* and exposed to photopériod long (18L: 6D) and the intensity of light ranging between (13 -10 lux) clearly shows these birds enter the refractory phase, but at different times.

Group at the exhibition for a long day measuring 13lux, be a late entry in the reduction compared to the intensity of the exhibition group optical estimated lux108. Therefore, the focus of proliferative starling birds at the day long-translated (18L: 6D) photopériod intensity is weak, as if a shorter duration of the exhibition with the photopériod (Bentley *et al*., 1997). is clear from the results obtained when the regiment blind and exhibition to the long photopériod (18L: 6D), gonad with sexual reproduction cycle similar to the full when the group was to control, this suggests that there is no relationship between the pupils and the extent of the measurement photopériod daily of the photopériod control in the early phase of reproduction. between (Benoit, 1991). The role of the optical receivers in the process of sexual activity where the subject of two groups of duck for a long photopériod of light, with one made the two groups eyes, he noted a reproductive cycle when two groups. Then he put a barrier at the level of the head black, noted the entry of these birds in the process of sexual Syncopations (no sperm formation) directly, since that study the same results were observed when the ducks and birds periodic Sparrows *Passer domesticus*, ducks, starlings *Sturnus vulgaris* (Wilson and Reinert, 1999) Thus, the indicator light does not affect the optical receptors in the eye and pineal gland on that do not know have a role in regulating the reproduction of birds, Where the removal do not affect either growth or reduction during the sexual glands (El-Halawani *et al*, 1991). Consequently, the optical receivers may be located at the level of the nervous system under the bed (Hypothalamus) which do not yet know precisely the region and its presence in receiving indicator light, on the other hand, the results obtained through this study clearly indicate that there is no role for the optical receivers in the eye to measure and control photopériod daily when pigeons. research has shown that under the circumstances, whether natural or artificial conditions the importance of the thyroid gland in the control of sexual activity at many of the birds, especially the phase of sexual inactivity, and when exposing birds starlings *Sturnus vulgaris* to the photopériod of not more than 11 hours light leads to the growth of this gonad sexual, but this is slow and not being able to enter into a phase of sexual inactivity in the same kind of birds that are at the stage of reproduction gonad sexual and unbalanced treatment of doses of the hormone thyroxin, under the same the photopériod, at least the volume of the gonad sexual and rapid intervention in the process of refractory phase (regression of the gonads) sexual after only 5 weeks from the beginning of the experiment (Goldsmith and Nicholls, 1984b). It is certainly, as recorded in the results of this research the importance of some hormones, especially testosterone, prolactin, however, there seems a clear effect of this hormone on the growth of sexual glands in the pigeons and by the for the first time being tested to demonstrate the importance of each of the hormone prolactin and the photopériod long-cycle management of the breeding refractory sexual treatment of pigeons *Columba livia* treated at two different doses of 10 and 20 ng / ml / of a bird / 3 days of the hormone prolactin, and prone to long-term light may not only prevented the natural growth of the sex glands, but enter a period of sexual inactivity and thus the beginning of the early stage of sexual Syncopations until the end of the experiment, when taking into account the results were low relative to the mean concentration of the hormone prolactin in the birds when the control, the group blind to suggest that there is a relationship between the extent of the impact of prolactin hormone, and optical receivers, the results were not two groups treated 10 and 20 ng / ml / of a bird / 3 days of the hormone prolactin, similar to those birds recorded at the control and the blind, the blind members of the group, and compared the two groups treated of 10 and 20 ng / ml / of a bird / 3 days of the hormone prolactin, the results showed an increase in the rate of testicular , where the volume of the passage of members of the group blind full reproductive cycle (to reduce the growth and endocrine sexual) were not similar to those recorded at a dose of 10 and 20 ng / ml / of a bird / 3 days of the hormone prolactin that the impact of the latter, with the clear reduction glands immediately after the beginning of the experiment, the doses are given more than the more concentrated the physiological effects of inhibition is clearly This conclusion is confirmed by the results obtained that the effect of the hormone prolactin and clear for the control of the breeding birds in the pigeons sector. Physiology, the interpretation of these results and observations is not clear to the lack of studies or previous experience in this area where other types of birds, and thus the assumption that there is a link between hormone thyroxin and the process of measuring the optical cycle of reproduction of birds, especially pigeons and quantities of the hormone thyroxin in the circulatory system has a direct impact on the alert optical receivers that are outside of the iris of each eye and pineal gland of the reception and measurement of the optical index, which affects the measurement of the optical-term way to make the daily estimated from the optical flying more than it is in the lead of the short period of sexual activity and to engage Early sexual inactivity. These results clearly show that the control of reproduction is possible when the male pigeon in the period by controlling the optical and hormone thyroxin specific and important role in concentration and there is a constant alert for the end of reproduction, however, it is possible to have a direct impact on the hormone secretion of hormones proliferative axis under the bed, (Hypothalamus - the pituitary gland - testicular) where the same impact in the way when most birds, the rise in the concentration of the hormone in plasma thyroxin observed when quails *Coturnix coturnix* (Sharp and Klandorf, 1981). Starlings *Sturnus vulgaris* and ducks, (Dawson, 1984). birds periodic *Passer domesticus* (Reinert and Wilson, 1996). as well as in pigeons *Columba livia* (Lechekhab, 1997). Exposed to a long day, it was found that could be a relationship between hormone concentration thyroxin in the axis of the circulatory system and reproduction, which monitors the process and thus reduction of sexual termination phase of reproduction.

But there are other areas have a direct or indirect impact on the breeding of birds as related to the main theme under the bed, (Hypothalamus - the pituitary gland), and during research carried out under either natural or laboratory conditions and the importance of the hormone prolactin in the control of breeding of birds, where increase in plasma concentration of the hormone prolactin are reduced before and during the male sexual glands when taking into account the change in the rate of prolactin concentration in the four groups, which had a high level of the groups treated of 10 and 20 ng / ml / of a bird / 3 days of the hormone prolactin is relatively high when the hormone treatment groups prolactin compared to those members of the regiment at the witness and the loss of patience, they can predict that such a rise in the level of concentration of the hormone prolactin in the plasma and therefore in principle not affect the growth of sexual glands in the hormone prolactin two groups factors compared with other groups, where at the beginning of sexual inactivity is happening in the content of reduced under the bed, nervous of GnRH (gonatropin-releasing hormone) and increase in plasma prolactin concentration of birds that feed it reflected negatively on the level of secretion of pituitary hormones discouraging feeding sexual glands of LH (Luteinizing hormone) and FSH (Silverin and Goldsmith, 1997) and the process of treatment hormone prolactin usually leads to low concentration of the hormone LH in the plasma and thus stop the process of formation of sperm, causing the size of reduction and delay of sexual glands, sexual fertilization to birds exposed to long photopériod of light (Buntin *et al*., 1987; Goldsmith *et al*., 1989).

While to engage in sexual inactivity is simultaneous with the gradual increase in plasma concentration of the hormone prolactin, (Silverin and Goldsmith, 1997; Goldsmith *et al*., 1985). Therefore, it must be noted that the decline could be linked to increasing the concentration of testosterone, the hormone prolactin, which is reflected at the level of nutrition lobe the front of the pituitary gland and the discouragement of the hormone LH, which affects the level of intra-cell (Leydig) pipeline between the sperm and urges them to produce testosterone and that the high note at the control and the group blind, and the existence of a sudden saying quantities of the hormone prolactin in the plasma, which led to the growth of non-endocrine sex in the pigeons at normal two groups factors prolactin This study demonstrated that the hormone prolactin treatment is an indirect cause for sexual inactivity,(Silverin and Goldsmith, 1997). the increase can be explained by a reduction in the average plasma glucose concentration at the control and the group blind See a large extent to the increase in sexual activity, which is where the power consumption caused by glucose in contrast to the groups treated of 10 and 20 ng / ml / of a bird / 3 days of the hormone prolactin, which was an increase in the concentration of glucose moral weeks during the experiment, but with regard to the impact of the photopériod, as well as hormone prolactin on the level of concentration of proteins and their relation to reproductive cycle may be linked to the influence of the hormone prolactin with the rate of concentration of proteins, where the rate of protein concentration at all groups during the 4 weeks of the experiment is relatively stable, raising the concentration during the week 6 and 8 at the witness and the group blind parallel for a period of sexual activity. However, an explanation of the photopériod mechanism long-term role of the hormone prolactin, and reduction in the sexual glands is a factor not to be limited to the role of the hormone prolactin and thyroxin only (Bentley *et al*., 1997). Generally reached from this experience is of great importance in the field of physiological reproduction of birds, especially pigeons and hormone prolactin is therefore an important factor for the arrest of reproductive phase at the pigeons.

## CONCLUSIONS

In light of this research is the photopériod of the most important factors in the process of creation and termination of breeding of birds and pigeons, especially the response of pigeons proliferative activity centered on an increase in the length of the photopériod, on the other hand and despite the continuation of the optical length of the entry of these birds in refractory phase (regression of the gonads), leading to sexual glands(testicular) and reduce the disturbance in the discharge axis is affected by the proliferative thyroxin and hormonal changes in prolactin and testosterone.

Conclusion can be drawn from this research that the increase in thyroxin and prolactin, although the length of the photopériod lead to the suspension of these secretions increase proliferative axis under the bed, (Hypothalamus - the pituitary gland - testicular) especially hormones LH and testosterone, which is the most important factor in the process of formation of sperm and an increase in the testicular volume.

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