The Effect of Some Routes of Artificial Insemination on The Egg Production .

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The present work was conducted to study the effect of semen deposition in different oviducal sites on the egg production in mid and late reproductive season . Four groups of layer hens were inseminated intra-vaginally , intra-uterine , intra-magnally and intra-peritoneally and the fifth group was mated naturally .

Results indicated that the egg number was markedly reduced during the first two weeks following intra-magnal insemination and recovered to the normal level by the third week. At the same time, egg number was slightly decreased during the first week following intra-uterine and intra-peritoneal inseminations, while intra-vaginal insemination had no adverse effect on the egg number .

The egg weight did not affect with the insemination routes .
On the other hand, some hens stopped laying during three weeks after intra-magnal and intra-uterine inseminations, while no pausing hens were observed after intra-vaginal and intra-peritoneal insemonations.

Although there are some limitations which retarted the use of artificial insemination (A.I.) in poultry production, this technique has had a commercial application in chicken breeding flocks in many countries . The influence of insemination technique on the egg production has been received the attention of

many researchers . Investigators including Cooper (1955) , Lorenz et al (1968) and Ogasawara et al (1972), found that intra-vaginal insemination (I.V.) had no adverse effect on the egg production .

The intra-uterine insemination (I.U.) was conducted by Bigth (1954), who observed that the egg production in thirty out of thirty seven hens was adversely affected . Eight hens laid soft shell eggs and twenty two hens caused laying and commenced to lay after lapses of 13 to 17 days . Van Krey et al (1966) used the improved I.U. route of Borbr et al (1965) . They found that the average egg production per hen during the first 22 days after insemination was 11.2 eggs, compared with 14.4 eggs after I.V. route . The difference between the values was insignificant .

The intera-magnal route (I.M.) was conducted by Van Krey et al (1966), Lorenz et al (1969) and Ogasawara et al(1972), who found that I.M. route affected the egg production adversely, but hens recovered by the third week after insemination .

Intra-peritoneal (I.P.) injection of semen into the region of the ovary , lead to sharp drop in egg production during the furst week after insemination (Van Drimmelen 1951, Brown et al 1963) .

Material and Method

Four groups of Dokki 4 hens in the first year of egg production were artificially inseminated in vagina , uterus , magnum and peritoneal cavity , by one single dose of 0.1 ml of pooled undiluted semen . Each group contained 50 to 100 hens. In addition , a group was naturally mated and thirty hens were seperated after single copulation . These insemination routes were carried out during mid season (January and February) and repeated in late season (April and May) .

Data on egg number , egg weight and egg sequence were recorded on individual basis for the different groups .

Statistical analysis were performed according to the methods described by Snedecor (1956) .

Results and Discussion

1 Egg number

Data of weekly egg number and egg weight during three weeks following artificial insemination in different sites of oviduct and natural mating are given in Table (1) and illustrated in figures (1 and 2) .

It is evident that egg number during three weeks of hens inseminated intra-vaginally was not different from that recorded by natural mating hens. This findings is valid for both periods of season . These results are inagreement with those reported by Cooper (1955) , Lorenz et al (1968) and Ogasawara et al (1972).

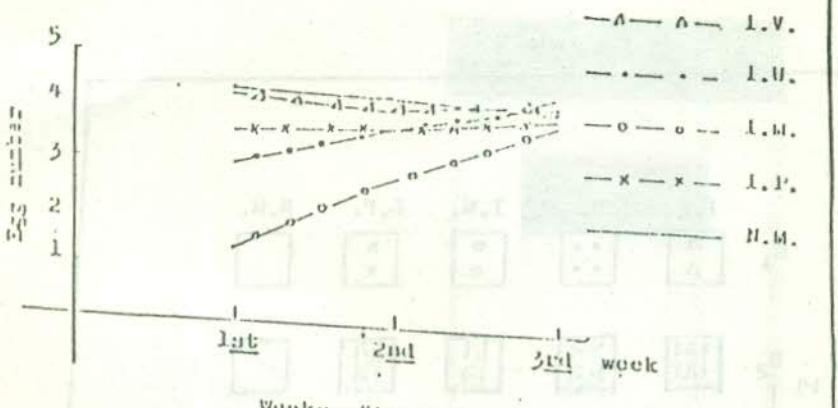
Figures (1 and 2) showed that after intra-uterine insemination as well as after intra-peritoneal insemination , there was slight decrease in egg number during the first week following insemination in both periods of season , but hens recovered to normal level by the second week. Similar findings were obtained by Allen et al (1955) and Bobr et al (1965). However, Blyth (1954) found that the most hens stopped laying after I.U. and hens recovered after a pause of 13 to 17 days of insemination. Van Drimmelen (1951) found sharp drop in egg production during the first 5 days after I.P.

Table(1) showed that egg number was markedly reduced for varying periods after intra-magnal insemination , but almost hens returned to the normal level by the third week in both periods of season . These observations were inagreement with the findings of Van Krey et al (1966) , Shindler et al (1967), Lorenz et al (1968) and Ogasawara et al (1972) .

The averages eggs laid per hen during three weeks after artificial insemination in different oviducal sites and natural mating are given in Table (1) and are illustrated in figure(3). The averages egg laid per hen showed highest values following I.V. and natural mating . At the same time, the lowest values

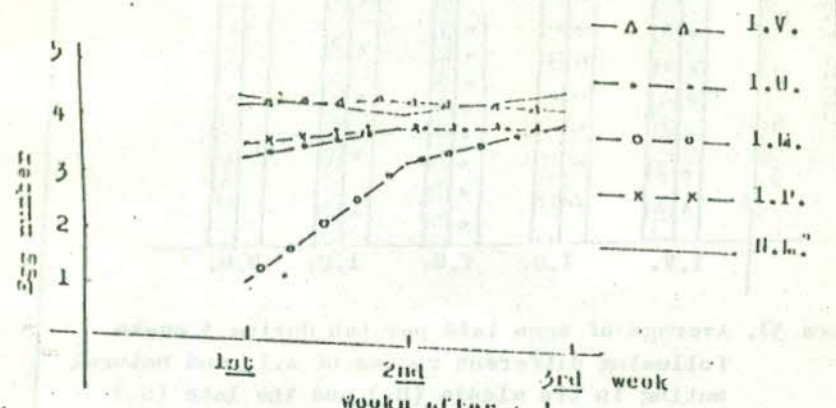
Table 1. Egg number and egg weight during 3 weeks following natural mating and artificial insemination in different oviducal sites during the mid (S_1) and the late (S_2) reproductive season.

A.I. route	Season	Egg number 1st week	Egg number 2nd week	Egg number 3rd week	Total eggs laid per hen (days 1-21)	Egg weight per hen (gr.)	Brooding hens
I.V.	S_1	4.33	4.10	4.33	12.76 ± 0.38	51.29 ± 0.33	0
	S_2	4.37	4.56	4.51	13.44 ± 0.38	51.02 ± 0.33	0
I.U.	S_1	3.07	3.78	4.29	11.14 ± 0.41	51.29 ± 0.35	10.82
	S_2	3.49	4.04	4.10	11.63 ± 0.40	51.47 ± 0.35	10.25
I.M.	S_1	1.41	2.86	3.93	8.20 ± 0.65	51.48 ± 0.51	17.24
	S_2	1.18	3.40	4.29	8.87 ± 0.63	50.83 ± 0.56	27.58
I.P.	S_1	3.68	3.77	4.02	11.47 ± 0.59	51.76 ± 0.51	0
	S_2	3.64	4.01	4.11	11.76 ± 0.61	51.60 ± 0.50	0
N.M.	S_1	4.47	4.30	4.15	12.92 ± 0.99	51.01 ± 0.73	0
	S_2	4.50	4.33	4.72	13.55 ± 0.84	50.15 ± 0.65	0



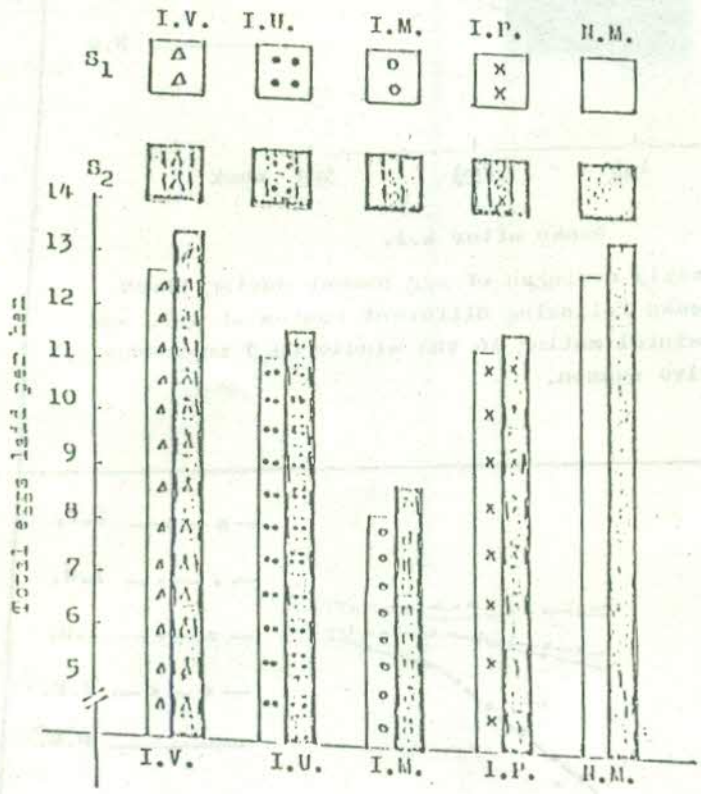
Weeks after A.I.

(Figure 1) Weekly averages of egg number during three weeks following different routes of A.I. and natural mating in the middle (S_1) reproductive season.



Weeks after A.I.

(Figure 2) Weekly averages of egg number during three weeks following different routes of A.I. and natural mating in the late (S_2) reproductive season.



(Figure 3). Average of eggs laid per hen during 3 weeks following different routes of A.I. and natural mating in the middle (S_1) and the late (S_2) reproductive season.

were recorded after I.M. Moreover, analysis of variance indicated that the differences in eggs laid per hen were highly significant (P 0.01) between the experimental groups . The evidence presented herein indicated that the egg number was affected by the site of semen deposition in the hen's oviduct.

2. Egg weight

Table (1) showed that all experimental groups had almost the same average egg weight in both periods of season . It may be concluded that the site of semen deposition did not affect the egg weight during the secretory activity of the oviduct .

3. The pause of laying

The percentages of hens stopped laying along 3 weeks after different routes of insemination are given in Table (1). The stopped laying hens were observed after I.M. and I.U. particularly in the late season . At the same time, there was no hens ceased lying in groups inseminated intra-vaginally or intra-peritoneally during both periods of season .

References

Allen,T.E. and Lidia Bobr (1955) The fertility of fowl spermatozoa in glycerol diluents after intra-uterine insemination . Poult. Sc. , 34 : 1167 -1772 .

Blyth,J.S.S. (1954) Notes on the poultry research centre flock of Brown Leghorn . World's Poult. Sc. J. , 10 : 140 - 143 (Cited by Bobr et al 1965) .

Bobr,L.W. ; Lake,P.E. ; Lorenz F.W. ; Ogasawara F.X. and Krzanowska H. (1965) Inhibition of ovulation in the domestic hen by intra-uterine insemination . Poult. Sc. , 44 : 659 - 661 .

Brown J.E. ; Harris, JR , G.C. and Hobbs T.D. (1963) Effect of intra-peritoneal insemination on egg production and fertilizing capacity of fresh and frozen chicken sperm. Poult. Sc., 44 : 810 - 815 .

Christensen V.L. (1981) Effect of insemination intervals on oviducal sperm storage in turkays . Poult. Sc., 60: 2150 - 2156 .

Cooper D.M. (1955) A comparison of artificial insemination with natural mating in the domestic fowl. Vet. Res. , 67 : 461 - 467 (A.B.A. , 23 : 425)

Lorenz,F.W. and Ogasawara F.X. (1968) The relations of fertility and embryonic mortality with site of experimental insemination . J. Reprod. Fert. , 16 : 445 - 455 .

Lorenz, F.W. ; Abbot U.K. ; Asmundson V.S. ; Adler H.E. ; Kratzer F.H. ; Ogasawara F.X. and Carson J.D.(1969) Turkey Fertility California Agr. Exp. St. Ext. Circ., 472 (cited by christensen 1981) .

Agasawara F.X. and Fuqua C.L. (1972) The vital importance of the utero-vaginal sperm host gland for the turkey hens. Poult. Sc. , 51: 1035 - 1039 .

Schindler H. ; Ben-David E. ; Hurwitz S. and Ora Kempenich(1967). The relation of spermatozoa to the glandular tissue in the storage sites of the hen oviduct . Poult. Sc. , 46 : 1462 - 1471 .

Sendecor G. (1956) Statistical methods . 5th ED. , the Iowa state Univ. , Ames , Iowa .

Van Drimmelen G.C. (1951) Artificial insemination of birds by the intra-peritoneal route . Onder-stepoort. J. Vet. Res. Suppl. , 1 : 212(A.B.A., 19 : 523) .

Van Krey H.P. ; Ogasawara F.X. and Lorenz F.W. (1966) Fertility of spermatozoa from infundibular and Utero-vaginal glands . J. Reprod. Fert. 11 : 257 - 262 .

تأثير بعض طرق التلقيح الصناعى على أنتاج البيض

صفاء الفت أمين ، حاتم عبد السلام محمد وعلى عبد المؤمن بكير
كلية الزراعة جامعة عين شمس ومعهد بحوث الانتاج الحيوانى - مركز البحوث الزراعية

أجرى هذا البحث لدراسة تأثير وضع السائل المنوى فى أماكن مختلفة من قناة مبيض الدجاجة على أنتاج البيض خلال منتصف ونهاية موسم الانتاج . حيث لقحت أربع مجاميع من الدجاج فى المهبل والرحم والمعدلم وفى الفراغ البريتونى ، ومجموعة دجاج خامسة لقحت طبيعياً .

ولوحظ أن عدد البيض قد تأثر بطريقة واضحة خلال الاسبوعين الاولين بعد التلقيح فى المعظم ولكن أستعاد مستواه الطبيعى فى الاسبوع الثالث وفى نفس الوقت أنخفض عدد البيض قليلا خلال الاسبوع الاول من التلقيح الرحمى والبريتونى . بينما التلقيح فى المهبل لم يؤثر على عدد البيض. كما أن وزن البيض لم يتأثر بالطرق المختلفه لوضع السائل المنوى فى قناة مبيض الدجاجه .

ومن جهه أخرى ، فقد لوحظ أن هناك بعض الدجاجات توقف أنتاج البيض بها خلال الثلاث أسابيع التاليه للتلقيح فى المعظم والرحم . بينما لا يكون هناك توقف لانتاج البيض بعد التلقيح المهبلى أو البريتونى .