STORAGE AND SURVIVAL OF TURKEY SPERMATOZOA IN THE DOMESTIC HEN'S OVIDUCT

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The percentage of fertilized eggs from chicken hens inseminated with turkey semen is very low (Warren & Scott, 1935; Quinn, Burrows & Byerley, 1937; Asmundsen & Lorenz, 1957; Wisoki & Soller, 1968), but it can be considerably increased by depositing the spermatozoa beyond the utero-vaginal junction (Kempenich-Pinto, Schindler, Bornstein & Baroutchieva, 1970). The question arose whether the insemination techniques also affected the accumulation of the turkey spermatozoa in the chicken oviduct. Therefore, in the present work, the storage of turkey spermatozoa in the chicken hen oviduct was studied by histological examinations after intravaginal inseminations or inseminations beyond the utero-vaginal junction.

Semen obtained from a local strain of Broad Breasted White Empire turkey toms was washed and diluted to its original volume with Tyrode solution containing chloramphenicol (500 µg/ml). S.C. White Leghorn hens were inseminated with 0.2 ml of the sperm suspension into the vagina (Smyth & Jeffrey, 1960), magnum (Schindler, Ben-David, Hurwitz & Kempenich, 1967) or uterus (Bobr, Lake, Lorenz, Ogawara & Krzanowska, 1965). Those hens inseminated into the magnum or uterus were injected intramuscularly with 75, 50 and 25 mg chloramphenicol on the day of insemination and the 1st and 2nd days thereafter, respectively. The utero-vaginal junction and the posterior part of the infundibulum were excised at 2 and 6 days after the inseminations, for histological examination. The excised segments were fixed in 4% formaldehyde. Sagittal sections were prepared from the utero-vaginal junction and transverse sections from the infundibulum. The sections were about 100 µ apart from each other and were stained with haematoxylin and eosin.

The regions and the relative sizes of the sperm accumulations resulting from the different insemination techniques are presented in Table 1. It can be seen that, after intravaginal inseminations, spermatozoa were stored in the utero-vaginal junction only. After intramagnum inseminations, they were present almost exclusively in the infundibulum and after intra-uterine inseminations, spermatozoa accumulated in both regions.

After intravaginal inseminations, sperm accumulations were small or absent, whereas after 'deep' inseminations, especially after intra-uterine ones, they were

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larger and present in all hens. Six days after the intravaginal inseminations, very few spermatozoa were found and all of them were in a state of disintegration, as indicated by the granular appearance of the sperm heads or by the presence of sperm fragments. Six days after ‘deep’ inseminations, appreciable sperm accumulations were still present but the number of disintegrated spermatozoa had increased considerably.

The poor viability of the turkey spermatozoa in the chicken oviduct revealed in the present work is apparently one of the factors restricting the interbreeding of these two species. It appears, however, that the adverse effect of this

<table>
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<th>Table 1</th>
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<td>PRESENCE OR ABSENCE OF TURKEY SPERMATOZOA IN THE UTERO-VAGINAL JUNCTION (UVJ) AND INFUNDIBULUM OF CHICKEN HENS AFTER INTRAVAGINAL, INTRAMAGNAL OR INTRAUTERINE INSEMINATIONS</td>
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<td>Site of semen deposition</td>
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<td>Hen no.</td>
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+, ++, ++++, ++++ = Estimated relative size of sperm accumulation resulting from different insemination techniques.
+—— = Presence of very few spermatozoa.
—— = Absence of spermatozoa.

‘gametic isolation’—a term introduced by Sinnot, Dunn & Dobzhansky (1958)—can be reduced to some extent by the use of a suitable insemination technique which increases the initial size of the sperm reserve and results, as shown elsewhere (Kempenich-Pinto et al., 1970), in an increased fertilization rate and in longer-lasting fertility.

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REFERENCES


Storage of turkey spermatozoa in chicken hens


