Artificial insemination is more an art than a science
Why art?

The procedure is not highly technical, but basic knowledge and appreciation of the bird’s anatomy is necessary.

Success depends largely on the patience and skill of the inseminator.

Why Artificial Insemination?

- Body size in sex dimorphism
- Cage feeding system
- Progeny test and special drake mating
- Increase mating ratio of female
- Increase the utility of drake
- To adjust the frequency of semen collection
Before AI

Implements for AI
- Semen collector
- Semen extender
- Semen collection tube
- Ice bucket
- Syringe and stand for semen collection
Semen collector

6 cm diameter, 18 cm stem, funnel

Sterilization, Rinse before semen collection

Semen extender

0.95% NaCl, glucose, sucrose
Semen collection tube

Calibration on ml, C.C.
Avoid contact with water, light

Ice bucket

Store fresh collected semen under 4°C
Syringe and stand for semen collection

0.1 ml glass syringe
0.2 ml glass syringe
Needle, 5 cm

Wooden, stainless

Flow chart for AI
Semen collection: different species, different way

Muscovy duck

Duck in egg laying  Drake in individual cage

The male used for artificial insemination

- Must be mature, healthy and physically normal
- Must be sexually active
- Must be tame, or at least not terrified when restrained or handled
- Should be free from external parasites
- Should be kept apart from, but preferably in sight of, females
- Should not be subjected to extreme temperatures
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Sexual drive

Stable mount

Ejaculation
Good quality

Poor quality

Pekin duck semen collection

Stand for semen collection  Restrain teaser drake
Massaging both side of spinal with fingers
Massaging around cloaca
Increase the pressure for 1 to 3 sec, ejaculation
Brown Tsaiya semen collection

Massaging both side of spinal with fingers

- Stroke the back from midpoint toward the tail with the right hand, massaging the abdomen from below with the fingers of the left hand
- After several vigorous strokes, transfer the right hand from the back to a position where the thumb and forefinger can apply pressure to either side of the vent
- This normally extends the copulatory organ and causes a flow of semen
Stroke the back from midpoint toward the tail with the right hand, massaging the abdomen from below with the fingers of the left hand.

After several vigorous strokes, transfer the right hand from the back to a position where the thumb and forefinger can apply pressure to either side of the vent.

This normally extends the copulatory organ and causes a flow of semen.
The volume and conc. of duck semen

<table>
<thead>
<tr>
<th></th>
<th>Muscovy</th>
<th>Pekin</th>
<th>Tsaiya</th>
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<tbody>
<tr>
<td>Volume (ml)</td>
<td>1.2</td>
<td>0.5</td>
<td>0.3</td>
</tr>
<tr>
<td>Conc. (10^9/ml)</td>
<td>2.0</td>
<td>4.0</td>
<td>7.0</td>
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</table>

AI condition suggested

<table>
<thead>
<tr>
<th></th>
<th>Tsaiya×Tsaiya</th>
<th>Pekin×Tsaiya</th>
<th>Muscovy×Chaiya</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low limited sperm no. injected</td>
<td>5×10^7</td>
<td>5×10^7</td>
<td>9×10^7</td>
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<tr>
<td>Volume injected</td>
<td>0.03</td>
<td>0.03</td>
<td>0.05</td>
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<tr>
<td>Interval of insemination</td>
<td>4</td>
<td>4</td>
<td>3</td>
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<tr>
<td>Dilution</td>
<td>1-4</td>
<td>1-4</td>
<td>No</td>
</tr>
<tr>
<td>Extender</td>
<td>Saline + glucose solution</td>
<td>Saline + glucose solution</td>
<td>No</td>
</tr>
</tbody>
</table>
Logistic curve of fertility rate after single artificial insemination

Fertile eggs can normally be obtained 48 hours after insemination and up to two weeks thereafter.

The percentage of fertile eggs from a flock begins to drop between four and seven days.

Twice-a-week insemination is enough to maintain a satisfactory level.
The female used for artificial insemination

- Must be in production, or she may be injured
- Must not have a hard-shelled egg in the lower part of her oviduct, so the sperm can move easily to the area where it unites with the ova

Semen injection

When handling and exposing the female, remember the duck is delicate and must be treated gently.

As the operator applies pressure, the vent exerts and an orifice appears on the left side.
Semen injection (cont’d)

An assistant should place the semen as deep as possible into this opening with a 0.1 or 0.2 ml syringe or similar device.

Semen injection (cont’d)

Relax pressure on the female’s body as soon as possible after insemination so the oviduct can return to its normal position, drawing the semen inward.
Avian oviduct

Male reproductive system
Factors affect fertilization rate -

**Drake side**
- Drake age
- Semen collection frequency
- Disease • harm
- Nutritional requirement

Factors affect fertilization rate -

**Duck side**
- Age
- Feeding density
- Disease • harm
- Nutritional requirement
- Inflammation of oviduct
- Insemination technique
Thanks for your attention!