

Artificial Insemination

"LOOK, LADY – YOU'RE THE ONE WHO ASKED FOR
A FAMOUS MOVIE STAR WITH DARK HAIR,
STRONG NOSE AND DEEP SET EYES..."



The basics
October 22, 2016
By Rebekah Clarke

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Background

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History



Ancient times people moved semen from freshly bred mares from one horse to another. Hoping to breed more than one horse with a single jump

In the 1700's Leeuwenhoek saw sperm under his (newly fashioned) microscope

In 1780 an Italian scientist discovered that you could inseminate an egg with that sperm (that Leeuwenhoek saw)

They also discovered you could slow or “deactivate” sperm by cooling it and then “reactivate” it by warming it back up

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Why use AI on your farm

- More diversity
- More options
- Opportunity to prove out bucks
- Store or “insure” bucks in case something happens
- Use long gone genetics
- Select and use proven bucks that you couldn't purchase
- Use a breed without owning the buck
- Cleaner before school 🤢 (you don't smell)

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Why shouldn't you use AI?

- Because you just don't want to own a buck
 - Because someone told you to do it
 - Because you can't really tell if your goat is in heat
 - Because you just bought your first goat and don't really know what you are hoping to breed for
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- Because conception rates are lower
 - It is more work than just tossing a buck in a pen, but not much more than hand breeding

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Supplies

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Semen tanks

There is a tank to fit every need. They can be large and small with different holding times (times between refill) and different weights

Pick something within your budget that will hold as much semen as you need. Assume that you can fit less in that on the label

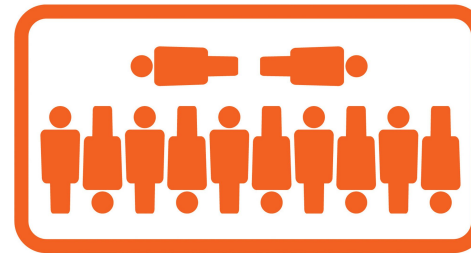
Consider if you will only be buying semen or will be collecting and selling your own.

Consider how you will get it filled (take it to the nitrogen seller or have them come to you).

Consider if it will sit at home or if you will be taking it to shows/convention

NOTE = MVE had nice pictures that were easy to steal, they are no more special than other tanks and I would recommend other tank brands just as much

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No one actually sleeps like this in a "holds 12 people" tent"

Semen tanks kinda work the same way. They never fit quite as many as they claim

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Very common example

Overall Height: 25.7" Overall Diameter: 14.
Weight Empty: 26 lbs. Weight Full: 62.4 lbs.

of 0.5 cc Straws (10/cane): 660
Static Holding Time: 227 days

\$650 - \$800

Probably one of the more common choices because
its low cost but decent size and good hold time



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Example - medium tank

Overall Height: 25.7" Overall Diameter: 14.5"
Weight empty: 26 lbs Weight full: 62.5 lbs

of 0.5 cc Straws (10/cane): 540
Static Holding Time - 137 days 20 Liters

Cost = \$800 - \$1100

540 straws = 54 canes. That could be up to 54
bucks, but if you have 30 straws of your own bucks
(3 canes) and then you have several canes with 1
straw... needless to say it fills up fast



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For example (a large tank):

Weight Empty - 36 lbs. Weight Full - 111 lbs.
Diameter - 20" Height - 26.4"

Cost = \$1300 - \$1700
Static Holding Time - 193 days 43 liters

#of Straws (10/cane): 1260

That means that really you have room for 126
canes. This can hold 10 straws or 1 straw. Each
cane take the same amount of room

That is a lot, unless you plan on having your
own bucks collected (and getting 10 canes to
sell... can fill up your tank quickly)



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What is a vapor shipper?

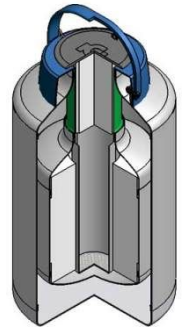
A Vapor Shipper is designed for the safe transport of
biological samples at -150°C or colder.

They contain a hydro-phobic absorbent that contains
the liquid nitrogen for "spill-free" shipping.
A protective shipping cartons gives the shipment a
"non-hazardous" classification.

of 1/2 cc Straws (10/cane): 120 (so 12 canes)
Normal Working Duration (days): 21 days

Cost = \$700 - \$1000 + Case = \$300-\$500

You can't mail a nitrogen tank full, this is your
option, but it doesn't make a good "full time" tank



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Used or New???

Sometimes you can find a good used tank from someone you trust for a good price. If it is in good condition, they can last for years so it is great option

Some people price their “used” tanks for the same price as a new tank. Sometimes a tank looks like it has taken a beating

****Saving \$300 on a used tank will not be worth it if you lose Thousands in semen if the tank is faulty****



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Do I need canes/goblets

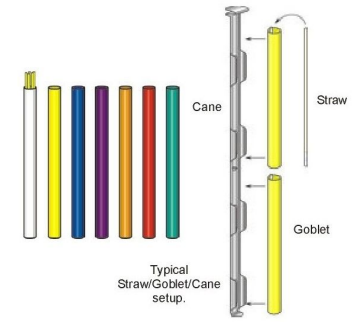
When you buy semen, it will come in a cane/goblet.

If you are making an order for your other supplies, you can always pick up a few, but you will need very few

If you sell semen you might want a few on hand for splitting canes (selling 5 instead of 10)

Canes = ~\$0.50 goblets ~\$0.30

You shouldn't pay much more than that



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Pre-made kit or make your own

Pre-made kits will be faster and ensure you don't forget anything

They are also more expensive and contain extras you might not need

If you have time to collect the supplies, you can get exactly what you need and spend less money

You can also pick and choose between different options.



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AI - Gun

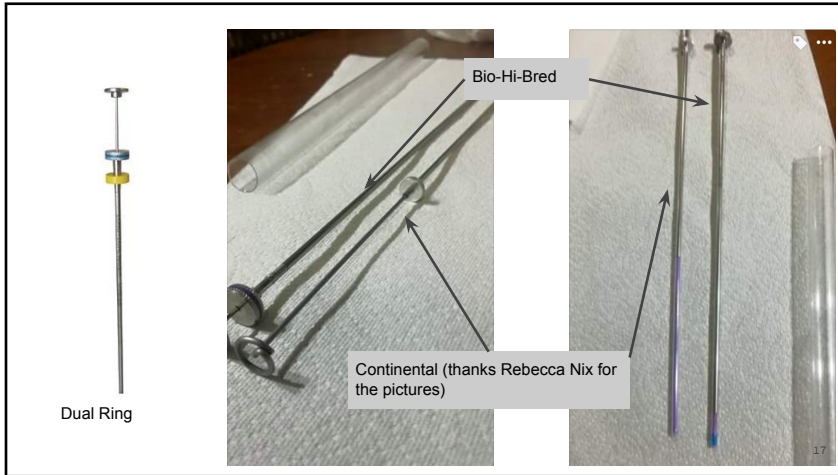
Side note = Pick a goat gun (not a cow gun) because it will be less difficult to handle

BIO Hi-bred - sold by Biogenics and I'd guess 1 of the most used. Easy to use. No parts to lose, fits normal goat straws. Highest recommendation. Buy at convention or nationals to save on shipping.

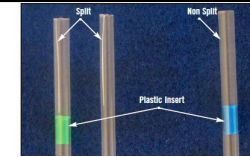
Dual-0-Ring - slightly less expensive. Has a plastic 0 which holds the sheath on at the top (which can be lost by someone like me). Can use .5 or .25 cc straws without extra work

Continental - Only sold in limited locations. (I was corrected that is wasn't discontinued) Gun doesn't extend past the straw so there is a little more flexibility at the tip (see pictures)

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Sheaths



At Nasco (for example)

Goat sheaths = \$8.60 for 25 (with Slit) or \$6.50 for 25

Cow sheaths = \$3.45 for 50... **just cut them down!**

If you have an O-ring gun - you need to have a slit in them

If you have a continental gun - you need to buy specific continental sheaths. (Biogenics has these) \$11.50 for 20

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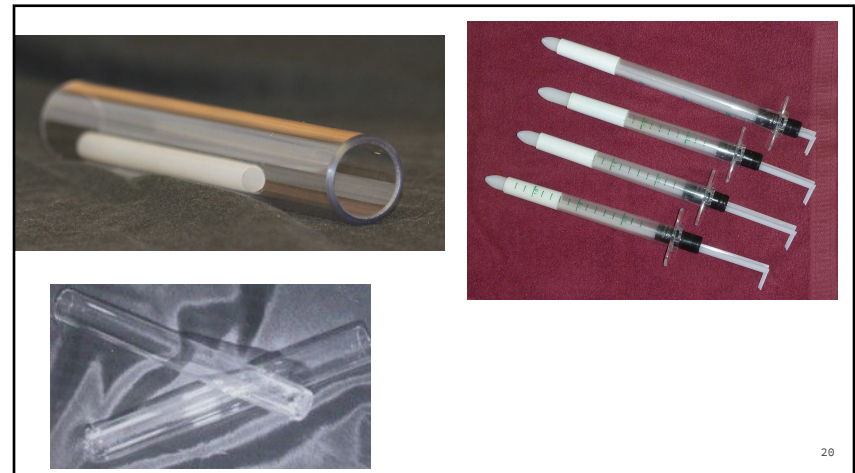
Speculums

Glass speculums - Easy to sterilize. Can be customized. Can be dropped... which would end their career. Never heard of one breaking in a doe

Plastic tube speculums - Plastic tube from a clear PVC. Grind edges to make sure there are no sharp corners. Can be purchased with a light holder.

Plastic graduated tubes - *based on the shape, I'm sure these are designed for another purpose, but I couldn't figure it out.* Tapered which is nice. Wings can make seating the light more difficult.

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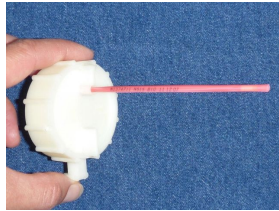
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Straw cutter

Yes, you could use scissors

Pay the \$8 and get the tool - your life will be easier because of it

Don't forget to clean it periodically, it will get kind of nasty otherwise



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Light options

Something small and something that isn't going to heat up

Small LED lights work great. Some speculums hold different lights better

This one (Super Ray) is my current favorite because of the price and size

Buy an extra one once you know what you like so you don't have it go out right as you are about to breed the doe.

Headlights as a backup can work... theoretically



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Thermos / Water Bath

Semen in the liquid nitrogen is stored at -321°F

A goat's uterus is somewhere closer to 103°F

Your goal is to warm it up slowly but not let it drop back downwards.

Some people do this with ice water, some people do this with warm water, some people do this under the arm (body temperature) As long as the straw doesn't cool down, the choice is yours

Remember that anything else touching the straw should be at the same temperature.



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Cold Water vs Hot Water

There are advantages and disadvantages to ice water thaw or warm water thaw.

Ice water you recover fewer cells, but they tend to live a little longer, so if you are ailing by yourself or if it's really cold in your barn, less chance of shock.

Hot water thaw you recover more cells and it's faster if you're in a hurry, but the cells don't live as long
Only thaw as much as you can use in a short (10-15 min) time in warm water.

Remember that water kills sperm, so if you use a water bath and your straw breaks, the sperm is dead.

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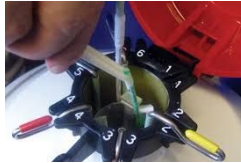
Tweezers



Handy, but unnecessary for the actual AI. You'll tend to grab the straws with your fingers

Grabber tool

At some point you are going to drop something in your nitrogen tank. These can be used to retrieve your lost straw or cane or goblet. Hardware stores sell them



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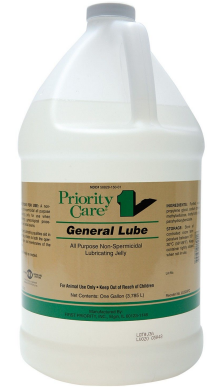
Lubrication

Anything water based and non-spermicidal will work

You will find there is less shame buying a gallon of lube at your local feed store than at the pharmacy

There is not a brand requirement or recommendation.

Buy a gallon and use it during kidding season

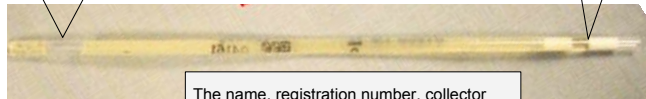


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The semen straw:

This end might be colored. You should cut the end without the white cotton plug. It might be crimped instead of plugged

The white cotton plug is what you push on with the gun. Don't cut this end.



The name, registration number, collector and collection date should be printed here. You will need this for your AI memo

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Where to buy semen

Remember that selling in a catalog is much more expensive and many breeders don't find it worth it. Some only sell this way, but most don't

Because of the high marketing charges and the 70/30 split, most semen sold that way is going to be higher cost to you as well

Hopefully you already have some bucks in mind that you want to use, but spend time searching herds websites/pages for semen lists. Ask for semen lists.

Talk to breeders directly! Look for older semen with the genetics you might want to use for a lower cost

Remember that semen quality (collector) is the most important part of settling a goat, after technician skill. Do your homework

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How much semen to buy? What type?

There is always going to be \$500/straw bucks. If you buy these your first year, you will probably not use them

Semen tanks do fill up. Don't rush to buy too much right away.

Buy 1 or 2 bucks (per breed) that you will use the first year. Something you would be proud to own kids from, but something that is not irreplaceable. USE IT!

Collect as you, but only buy things you will use. Let someone else hoard.



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A Math Equation: (3 examples)

EXAMPLE 1

-You buy 10 straws of EXCITING (expensive) OLD buck

- You don't use it because you are new
- She is bred live.

- You paid for a year of nitrogen but were too scared to use it

EXAMPLE 2

-Interesting buck comes up for sale. Not too expensive, you buy 10 straws

-You use 2 straws. She settles

- Your tank still has 8 straws that you might not use for years

EXAMPLE 3

-You buy 5 straws of older but cool semen for \$5 a straw

-You use 2 straws and she settles Or
-You use all the straws on multiple breedings
-You aren't paying have semen sitting around.
-You have AI kids coming or even if they didn't settle you were able to practice AI low cost

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How much should I pay for semen?

Honestly, anywhere from \$500 per straw (perhaps overpriced?) to at cost = about \$3 per straw

For your first year, I'd aim for between \$5-\$25 per straw. Anything more and you might be tempted to "wait" to use it until you are "better" at AI

Don't buy semen that you aren't sure about having kids from. It will sit around taking up space.

Buy thoughtfully and purposefully. Research pedigrees!!

Save money by buying older semen with famous relatives but maybe weren't used as much. Or buy young unproven animals, Especially if you can offer help proving out a buck, you will get a better price..

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Semen Buying.... Courtesy reminders

- The price of the semen is not an open invitation for negotiation.
- You are buying semen, not making a new BFF.
- If you are planning to have it shipped, it will be expensive. Buy more than 1 cane for shipping.
- Buy semen with forethought. Use nationals, convention, and hauling trips to lower the cost of your getting your semen. But offer to help pay for your semen if someone is bringing it for you.
- You are almost always buying in 5 or 10 quantities. Semen for sale at \$50/straw is not (usually) being sold in 1 or 2 straws.
- Trade with people when you have 2 straws you don't need and they have 2 straws you want.

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Procedure

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Track your heats

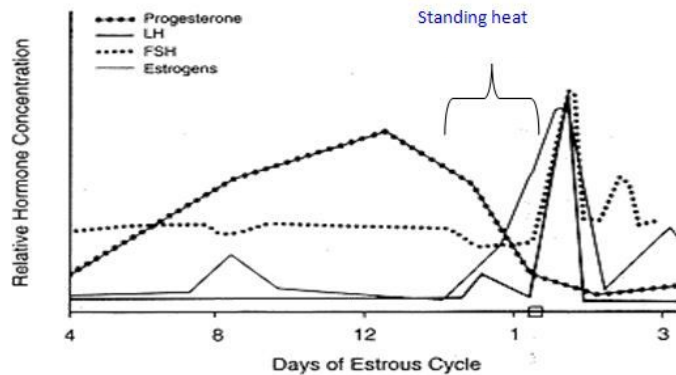
If you are breeding naturally, the earlier heats **tend** to be more fertile so start tracking heats as soon as you can.

Breeding in October will be better than January because you will have a better shot at re-breeding

Identify how long a doe's heat tends to be - you want to AI at the end.

A standard: Doe seems like she is coming into heat Sunday night. She is in a full standing heat Monday morning. Breed Monday night AND/OR Tuesday morning. If using only one straw, use the later time.

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Using a Sync protocol

Sync protocols let you plan when to breed (so you know you will be around) and plan for kids

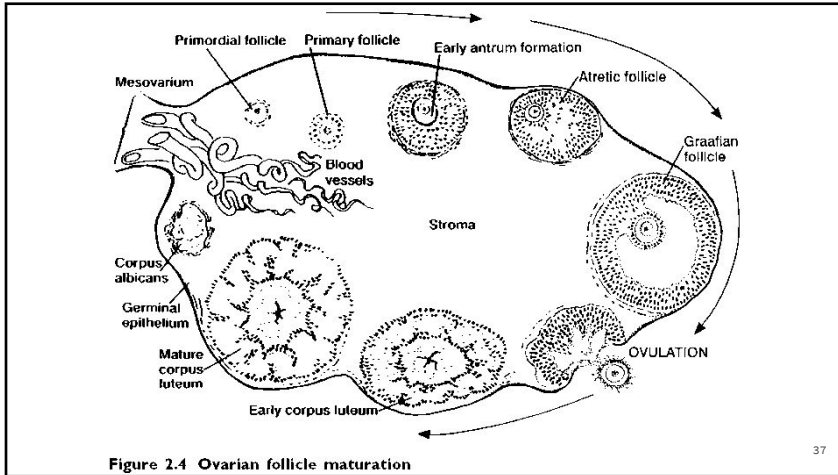
Hormones at your fingertips:

Progesterone - acts like there is a pregnancy or growing follicle. When removed, doe comes into heat

Prostaglandin: destroys the Corpus Luteum ending the waiting cycle and brings a doe into heat. Used to end pregnancy as well.

Gonadotropin: signals the release of follicles

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Sync protocol examples

CIDR - progesterone implant

Lutelyse - Prostaglandin

Day 1 - insert a CIDR

Day 13PM (but up to 16 as needed) -
remove CIDR, administer PG600 and
Lutelyse (in season)

Day 16AM (or 36 hours from removal)
- AI breed does.

Does who has been cycling, inject
Lutelyse at least 10 but not more
than 18 days past their last cycle

Does should come into heat 3-5 days
after injection

Find a protocol that works for you. Talk to people in your area, vets, or other experienced breeders. When you pick one follow it. Don't try to mix protocols until you feel comfortable with the drugs/goats. And don't read every piece of advice on facebook. You wouldn't follow every piece of breeding selection advice... don't start now.

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My does in heat!!!!

Breed at the end of her heat cycle

You can look for mucus (cidrs can change the vaginal environment and mess up the mucus)

You want stringy, sticky cloudy
Not = solid white or super clear.

Hopefully you have your breeding plans keyed up and your semen tank inventoried so you know what semen you want.

When you AI, having a helper is very useful. You can do it alone, but a second person is great if you can

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A Situational Example

With two people

You will have to find what works for you and what works with your equipment.

I offer a look into my world when we AI a goat

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Person 1 (of a 2 person system)

Goes outside with speculum and light (also lube if you aren't keeping it outside)

Catches doe

Puts doe on milk stand (treats are always nice, but don't make her run out in the middle and start kicking)

Lubes up speculum and clean off the doe so that nothing gross gets inserted. Then insert the speculum into doe. (usually timed so the doe isn't standing there forever)

Uses light to find cervix for person bringing out semen.

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Person 2 (of a 2 person system)

Warms up gun under shirt (a front zip sweatshirt is helpful)

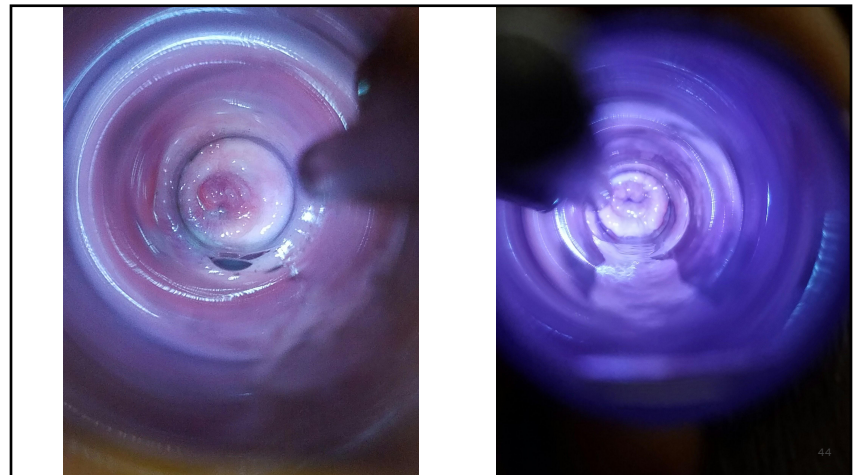
Collects sheath (wrap in paper towel and put under arm/shirt)

Puts straw cutter in pocket

Removes straw from tank. Wrap in piece of paper towel to protect. Put under arm

Head outside to goat

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Actual insemination

One person holds the goat

Other person: (this could be done inside before leaving)

- Cut the straw (while still wrapped in a paper towel)
- Places straw in sheath (cut end down) while sheath is still in paper towel under arm (keeping warm)
- Push straw down with gun, lock sheath in place

Find cervix in speculum view

Line up gun into cervix gently manipulating through as many rings as possible. Slowly inject semen. You can inject in a few points

Remove speculum and gun from goat once semen is inserted.

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Problems and Pitfalls

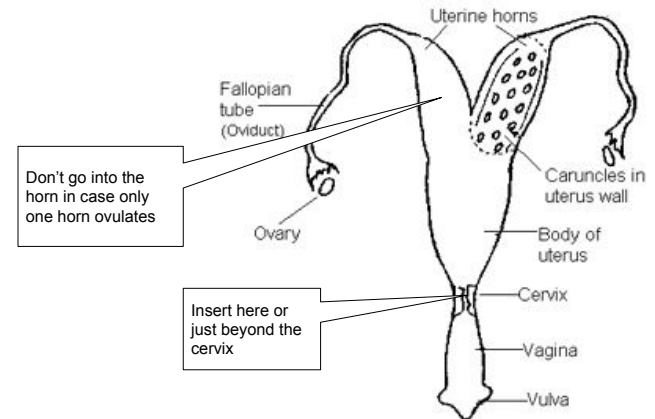
Blowback - the straw is poorly placed and the semen ends up in the sheath.

Fix = use a sheath with a colored insert to keep the straw in the right place

Semen in the vagina - semen ends up flowing back out of the cervix
Fix = put less pressure on the cervix with the speculum. Be sure to slowly go through as many rings as possible. Deposit slowly and look for back flow before depositing the whole straw.

Blood - the cervix is highly vascularized while in heat. Minimize blood by being gentle, but it isn't cause for panic.

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What you need to take outside

Speculum

Lube - could be left outside

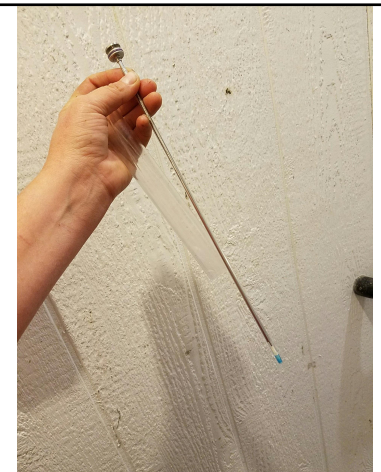
Sheath

Light

Gun

Straw

Straw cutter



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My Doe is in heat and I'm solo!

One person breeding variations

Getting the goat up on the milk stand (or near the milk stand, depending on safety) before you get the semen out. You don't want to be running after a goat while keeping semen warm in your sweater.

You can stand behind the goat OR you can stand over the animal and go in upside down (the vagina is a circle), it looks the same upside down.

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Clean-up

Make sure there is not any sign of infection on the speculum or gun

Remove the sheath with the straw attached. You will need that straw for kid registration.

Semen can't live outside the body for long. It is a good idea to keep your equipment clean, but you don't need to sanitize obsessively.

Washing the speculum through the dishwasher or warm soapy water is sufficient.

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Frequently Asked Questions.....

** Disclaimer. Answers are my opinions. You might get different answers if you ask someone else. **

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Who are good candidates for AI?

Generally does who have kidded before

Does have have not had recent (the last year) kidding problems or settling problems

Does who have regular heat cycles.

Virgin dry yearlings can be bred, although I've had less success. I have never settled a kid by AI

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What is the best month to AI my goat?

Starting early allow you to have a backup plan

Earlier heats tend to be more fertile than later heats but the first heat of the year can be erratic.

I recommend September and October as your primary target with a backup with for November. You probably are going to want to want to live breed by December

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I just bought an AI tank - what should I do now?

- 1) Fill it and let it sit for a while without semen in it. Make sure it is not getting condensation and that you have a good idea of how much
- 2) Find the best place for your tank. Somewhere that is off the ground (or on carpet) and that you will see regularly. Somewhere away from creatures that can knock it over
- 3) Buy some semen that you can be (A) proud to have kids from (B) willing to use up completely while you try AI (C) won't be upset if you "waste" while practicing
- 4) Check the height of your nitrogen regularly. Get a sense of how often it needs to be filled during times you are using it regularly (fall) and times when it is sitting quietly (spring)

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How long should you raise goats before you start thinking of AI?

This question is the same as asking "When should I start showing"

It is never too early or too late.

When you can afford it

When you want the diversity it offers

When you don't want to have multiple bucks

When you want to invest in it.

When you want to only have a baby buck around

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Can I use AI and never own a buck?

I'm sure there are people who successfully AI without owning a buck.

A buck does a good job of heat detection and identifying what stage of the heat the does is in

There are always going to be does (or years) that don't settle AI. These are probably going to require a buck around

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Back in Heat?

I AI'ed my goat 21 days ago and she seems to be going back into heat - what do you recommend?

Option A = it is still early, go for it. Why not?!

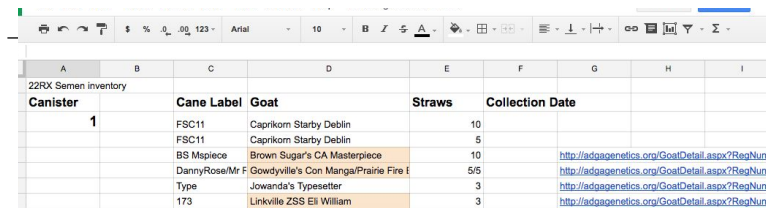
Option B = Not going to happen this year, better live cover

I AI'ed 5 days ago, and she is back in heat!?

In this case, I'd probably just re-AI with the same semen. If you use different semen you will inevitably need to DNA test

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Semen Inventory



Canister	Cane Label	Goat	Straws	Collection Date
1	FSC11	Caprikorn Starby Deblin	10	
	FSC11	Caprikorn Starby Deblin	5	
	BS Mspiece	Brown Sugar's CA Masterpiece	10	http://adpagenetics.org/GoatDetail.aspx?RegNum
	DannyRose/Mr F	Gowdyville's Con Manga/Prairie Fire	5/5	http://adpagenetics.org/GoatDetail.aspx?RegNum
	Type	Jowanda's Typesetter	3	http://adpagenetics.org/GoatDetail.aspx?RegNum
	173	Linkville ZSS Eli William	3	http://adpagenetics.org/GoatDetail.aspx?RegNum

Spreadsheet or Google Sheets work well

A designated notebook/composition book also works

Lots of templates out there

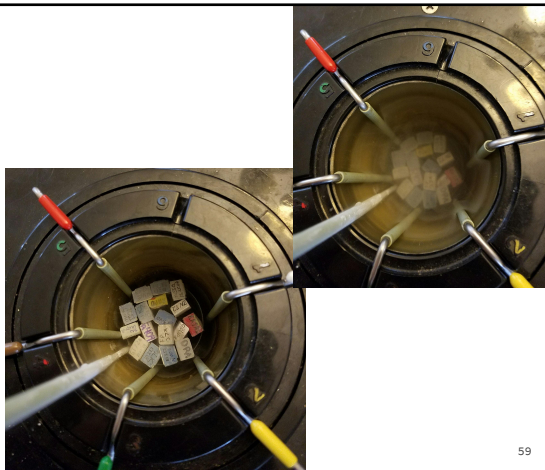
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Inventorying

This is all you can see when you are pulling out a straw

Being sure you know what each cane is, is essential

Try to only pull up beyond the frost line for 7 second or less



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Other Questions?

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