

Embryo Transfer—The Last 20 Years

Randall H. Hinshaw, D.V.M.
Ashby Embryos
2420 Grace Chapel Road
Harrisonburg, VA 22801
1-800-296-2697
randall@ashbyvets.com

Embryo Transfer—The Last 20 Years

Old Truths
Donors
Recips
Chance
New Technologies/Ideas
Ultrasound
 Donor synchronization
 Recip synchronization
Expectations
Sexed semen
IVF
Reasons for ET
Costs

Old Truths

The donor is largest variable in embryo production
Not FSH/protocol
Not practitioner
Not environment

The recip is the largest variable in conception rate
Not the embryo
Not the practitioner

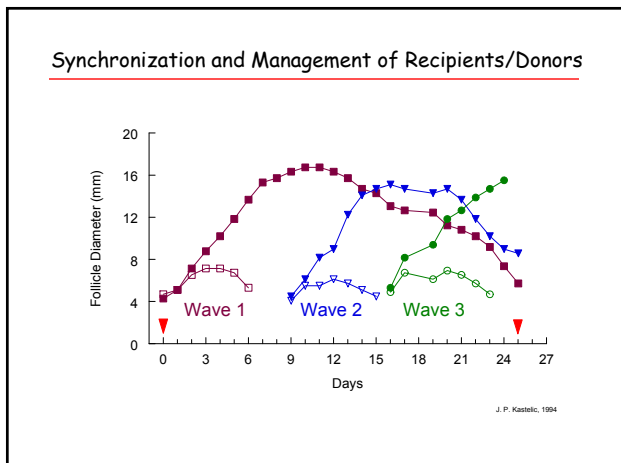
Chance is the largest variable in small groups

Ultrasound



Why Ultrasound?

Able to diagnose pregnancy earlier
More accurate
Less invasive
Confirm fetal viability
Diagnose fetal anomalies
Fetal sexing
Assess superovulation before breeding
Understand follicular dynamics



Synchronization and Management of Recipients/Donors

"TOOLS" for SYNCHRONIZATION

- PROSTAGLANDIN - *Lutalyse/Estrumate*
- GONADOTROPIN - RELEASING HORMONE (GnRH) - *Cystorelin, Factrel, Fertagyl*
- PROGESTIN - *Melengestrol Acetate (MGA); CIDR (controlled internal drug release device)*

Synchronization and Management of Recipients/Donors

"TOOLS" for SYNCHRONIZATION

- PROSTAGLANDIN - *Lutalyse/Estrumate*

Prostaglandin $F_{2\alpha}$ injected between day 5 and 20 of the estrous cycle regresses the corpus luteum (CL).

Synchronization and Management of Recipients/Donors

"TOOLS" for SYNCHRONIZATION

- GONADOTROPIN - RELEASING HORMONE (GnRH) - *Cystorelin, Factrel, Fertagyl*

GnRH causes a Luteinizing Hormone surge:

CL • follicle "turnover" / "new" follicle development

Synchronization and Management of Recipients/Donors

"TOOLS" for SYNCHRONIZATION

- GONADOTROPIN - RELEASING HORMONE (GnRH) - *Cystorelin, Factrel, Fertagyl*

GnRH causes a Luteinizing Hormone surge:

CL • follicle "turnover" / "new" follicle development

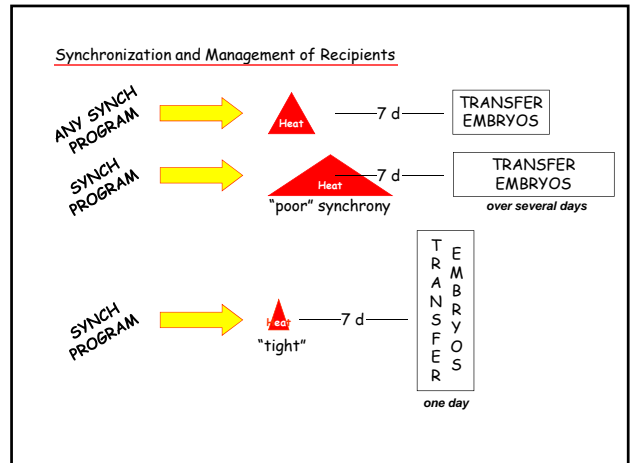
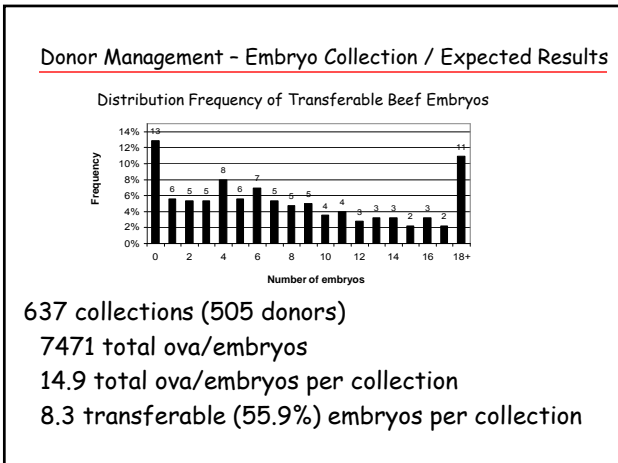
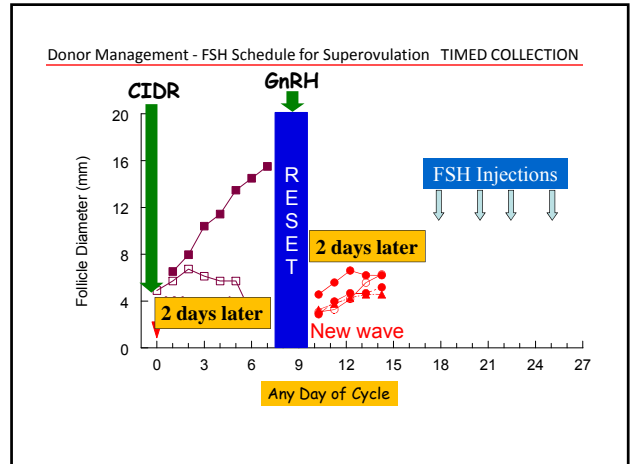
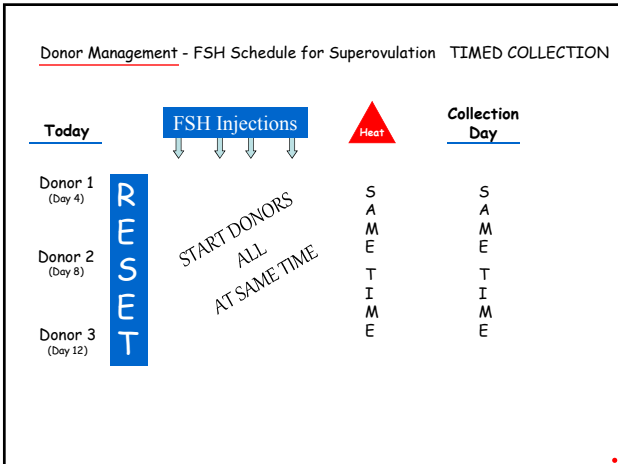
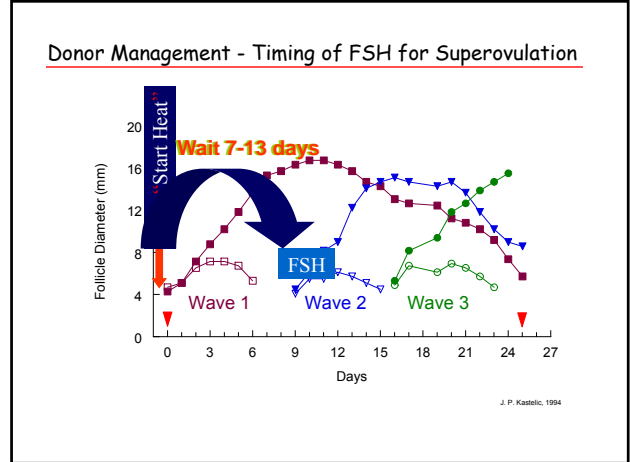
NO CL • ovulation of a follicle

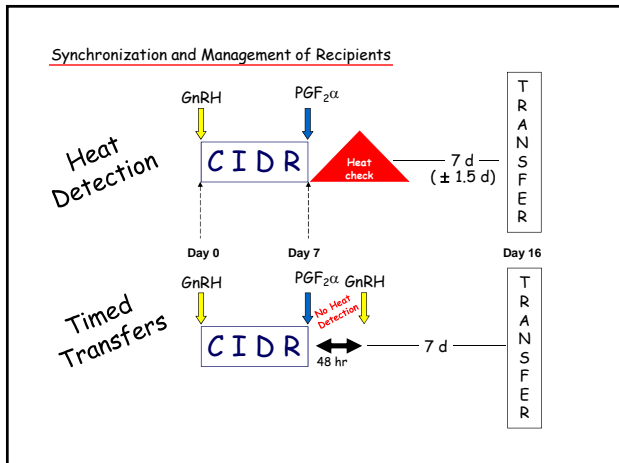
Synchronization and Management of Recipients/Donors

"TOOLS" for SYNCHRONIZATION

- PROGESTIN - *Melengestrol Acetate (MGA); CIDR (controlled internal drug release device)*

Administration of a progestin (MGA or CIDR) inhibits heat and blocks ovulation = "artificial CL"





Synchronization and Management of Recipients - Expected Results

Angus Farm #1 (2 years)

Fresh embryos			Frozen embryos		
Grade	Transfers	% Pregnant	Grade	Transfers	% Pregnant
1	1543	71.9	1	436	60.8
2	671	61.4	2	108	57.4
3	15	46.7	3	7	42.9
Total		68.6	Total		59.9

Synchronization and Management of Recipients - Expected Results

Contract Recipient Herds

Location	1	2	3	4	5	6	8	9	Total	
Transfers	437	111	57	43	70	91	295	496	37	1637
Preg rate	66%	44%	46%	63%	60%	52%	63%	60%	54%	60%

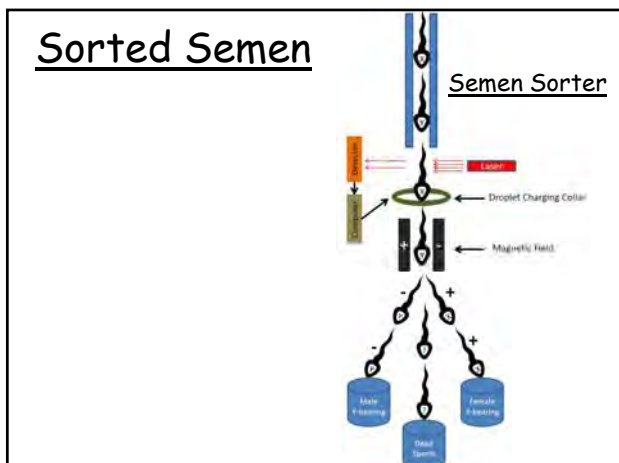
Average is OK, but notice the range.

Synchronization and Management of Recipients - Expected Results

Frozen embryos - "expect 55-60%"

Grade	% Pregnant
1	Best
2	10-15% lower
3	20-30% lower

Fresh embryos - "expect 7 - 10% better than frozen embryos"



Sorted Semen

Reduces transferable embryos by ~ 50%
 Bull dependent
 Better results in virgins
 Splitting embryos improves output
 Used with IVF

IVF-In Vitro Fertilization

Donor's ovaries aspirated transvaginally
 Oocytes matured and fertilized
 Embryos transferred

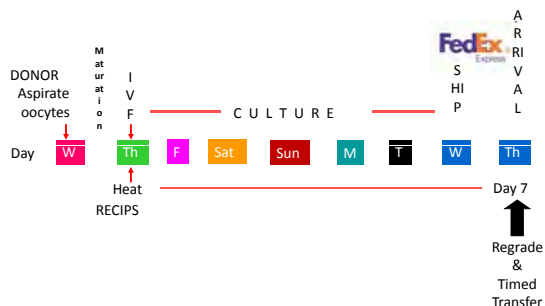
IVF-In Vitro Fertilization

Advantages
 Every other week
 Sexed semen
 Use valuable semen on multiple donors
 Problem donors
 Able to aspirate pregnant cows

IVF-In Vitro Fertilization

Disadvantages
 Cost
 Need to transfer fresh
 Lower conception rates
 Higher pregnancy wastage
 Higher incidence of fetal anomalies
 Logistics

In-Vitro System for Embryo Development



In-Vitro System for Embryo Development – PREGNANCY RATES

Total Shipped	854			
Total Recovered	854			
Total Transferred	785			
Percent Transferred	92%			
	Transfers			
Grade	1	2	3	Total
No.	568	190	27	785
Pregnant	357	88	6	451
% Pregnant	62.7%	45.8%	22.2%	57.5%

Common Reasons for ET

Improve genetics - ET vs AI
 Herd expansion
 Market individual cow families

ET Cost of Production

<u>Item</u>	<u>1 Donor</u>	<u>5 Donors</u>
Collection	\$300.00	\$1000.00
Fee/Donor (drugs, flushing donors, etc)		
Semen (3 units @ \$30/unit)	\$ 90.00	\$450.00
Freezing fee	\$350.00	\$1400.00
Total	\$740.00	\$2850.00
Avg. Embryos/Collection	7	7 (35 total)
Estimated Cost/ Embryo	\$105.71	\$81.43

*Costs do not include farm labor, overhead or donor maintenance.

