

Pregnancy Rates in Natural Service and Artificially Inseminated Dairy Herds

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Overview

- Use of Al vs. NS bulls
- Reproductive efficiency
 - Florida study
 - Other studies
- Other considerations



Use of natural service (NS) bulls on cows

- Florida survey (1984): 50% of dairies use mostly AI, 12% mostly NS bulls, 38% mixture (Chenoweth and Larson, 1992)
- National survey (2002): "Most (55%) operations used bulls as a component of their breeding program and 89% of these bulls were dairy bulls" (NAHMS, 2002)
- Eastern US (2002): 26% use only AI, 62% use some bulls, 12% use mostly bulls (Smith et al., 2004)

Use of natural service (NS) bulls on heifers

- Pennsylvania survey (1987) (Heinrichs et al., 1987)
 - 329 Pennsylvania dairy farms
 - 11.2% of heifers bred 1x by AI, then by NS bull
 - 8.5% of heifers bred 2x by AI, then by NS bull
 - 20.7% of heifers bred by NS bulls only
- 1997 Hoard's Dairyman continuing market study
 - 50% of dairies use a bull for breeding dairy heifers
 - 42% of dairies use a bull for breeding cows

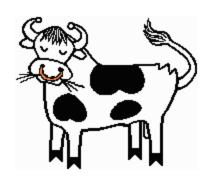
Motivation for use of NS bulls

- "Bull does better job detecting heats"
 - Lack of well trained personnel
 - Perception is that reproductive performance may improve because more cows are detected in estrus and serviced (Risco, 2000)
- "Bulls are cheaper"
- "Bulls are genetically adequate"
- Replacement heifers are purchased

Florida study: Overview

de Vries, Steenholdt, Risco, 2004

- 1. Calculate pregnancy rates in DHIA herds
- 2. Determine if herds use <u>AI</u>, bulls (natural service; <u>NS</u>) or both (<u>mixed</u>)
- Compare pregnancy rates in AI, NS, mixed herds



Cow Data

- DHIA Lactation records
 - 8 years: 1995-2003, herds located in FL + GA
 - 2 seasons: Winter (November April)
 Summer (May October)
 - \rightarrow 8 x 2 = 16 periods
 - Pregnancy rates calculated per herd, per Season (16 periods maximum per herd)

Pregnancy rate

- = # cows pregnant / # cows eligible to get pregnant, in a 21- day period
- heat detection rate x conception rate

126 Q-Month Prognancy Pate Summary by Days in Milk

E.g. 50% x 40% = 20% pregnancy rate

PCDART

VWP:70 PgCk:45

(No Exclusions)

Ref:10-26-04

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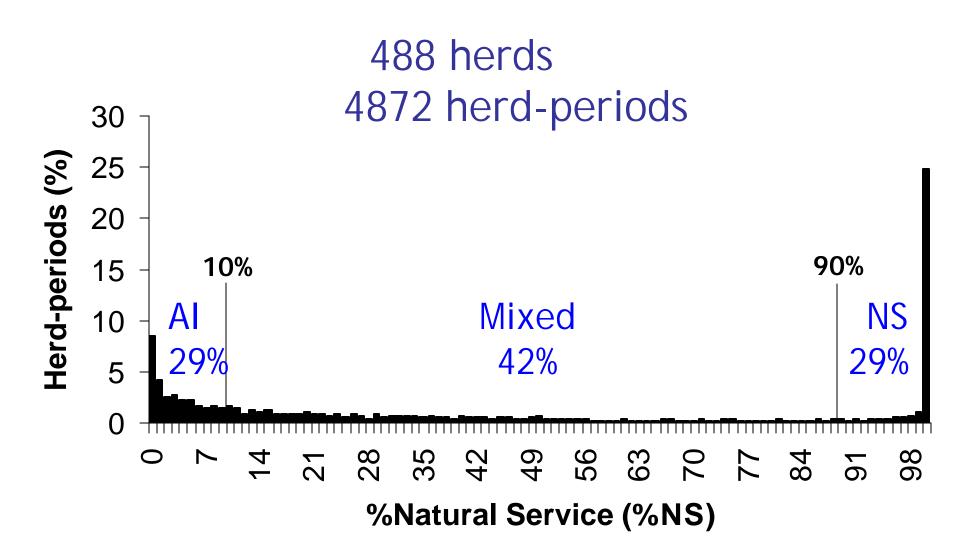
Herd Data

- DHI Herd Summary 202 records
 - Genetic profile of service sires

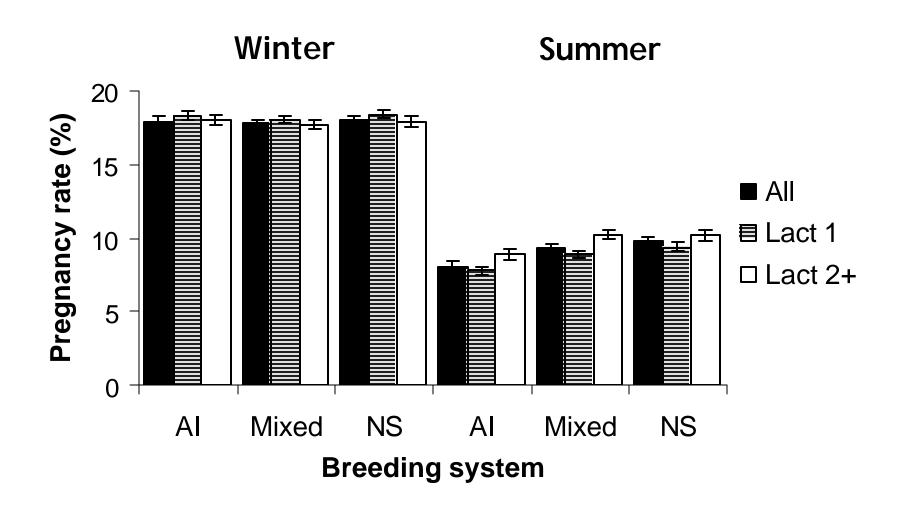
- % OF HERD BRED TO
 - Proven Al sires: → Al bred
 - Al young sires: → Al bred
 - All other sires: → Natural Service (bull bred)

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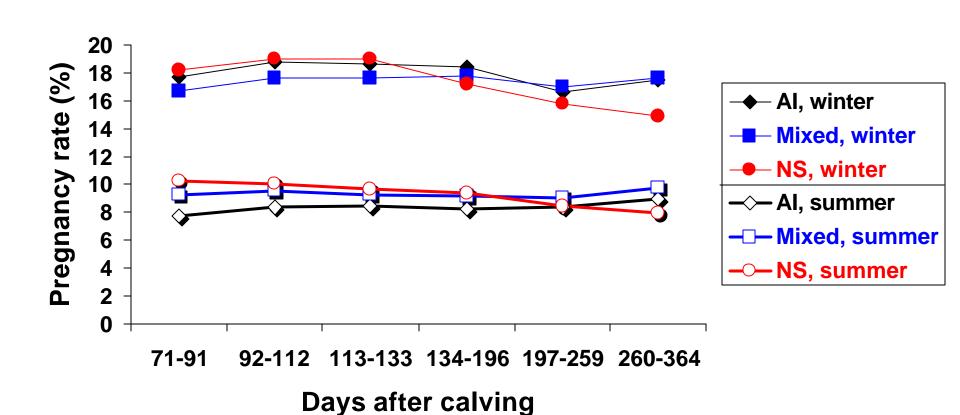
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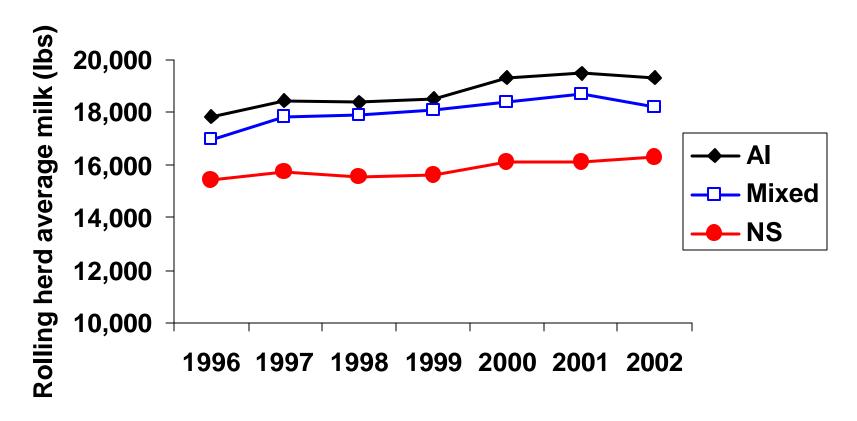
Effect of lactation number



Effect of stage of lactation



Milk production over time



The <u>change</u> in milk production from year to year was not significantly different between the AI, mixed, and NS breeding systems.

Other studies (I)

- 96 Australian herds (1973, 1974), (Williamson et al., 1978)
 - Some herds used only AI, some used only NS, some used a mixture.
 - Conception rates of cows bred by AI or NS were not different (both 58%).
 - Conception rates in herds that used NS bulls were more variable.

Other studies (II)

- 3 herds in California (Niles et al., 2002)
 - NS bulls used as "clean up" bulls (cows open = 110 to 130 days in lactation)
 - Pregnancy rates (%):

Season	Al	NS
Winter	18.3 ± 1.8	23.2 ± 1.8
Spring	22.1 ± 2.1	23.2 ± 2.1
Summer	14.8 ± 1.5	14.5 ± 1.5
Fall	22.3 ± 2.1	21.2 ± 2.1

- Differences not significant.

Other studies (III)

- Eastern US DHI Summary Reports (Smith et al., 2004)
- Breeding system determined from genetic profile of service sires

	ΑI	Mostly Al	Mostly NS	NS	SEM
Calving interval (months)	14.1	14.2	14.3	13.5	0.02
Days dry	65.1	67.1	68.9	68.8	0.16
% Dry 40 to 70 days	70.3	67.2	59.5	49.9	0.26
% Dry > 70 days	22.6	25.3	30.3	34.8	0.22
% Dry < 40 days	7.2	7.6	10.3	15.3	0.17
% Cows leaving herd	34.3	34.4	34.2	33.4	0.18
% Left for repro reasons	7.6	7.0	6.4	5.5	0.09
% cows in milk	87.5	87.0	86.4	85.0	0.05

Different colors in a row indicate statistical significant differences (P < 0.05)

Conclusions

- In FL and GA, pregnancy rates in the winter were twice as great as in the summer.
- No meaningful differences between the AI, NS and mixed breeding systems in either season.
- Natural-service herds produced less milk, but the change in milk production was not significantly different from the other breeding systems.

Other Considerations

- Number of bulls (~1:25)
- Feed cost (~\$2 / day)
- Health care (breeding soundness exam, vaccinations)
- Extra facilities needed
- Danger
 - "To my knowledge no one has ever been killed by an Al technician"
 - unknown

Thank you!

