

RESEARCHES REGARDING THE EFFECT OF $\text{PGF}_{2\alpha}$ ADMINISTRATION INTERVAL ON COWS ESTROUS SYNCHRONIZATION

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Abstract

To improve reproductive efficiency of a dairy farm hormonal treatments for estrus synchronization are used. These allow heat and A.I. grouping to a specific time interval. In our experiments, we studied the estrous and A.I. grouping after the utilization of three hormonal synchronization programs. The protocols consisted of a single administration of $\text{PgF}_{2\alpha}$, to females with known estrous cycle and AI at 5 days interval, the other two protocols, applied to females with unknown estrous cycle, consisted of two doses of $\text{PgF}_{2\alpha}$, administered at 11 or 14 days interval respectively, and heat detection after the second dose administration. There were no significant differences ($p > 0.05$), between the heat manifestation rates, to cows which were stimulated with two doses of $\text{PgF}_{2\alpha}$, at 11 days interval (85.7%), comparing to cows stimulated with two doses of $\text{PgF}_{2\alpha}$ at 14 days interval (88.2%). Significant differences ($p < 0.05$) were observed between the heat manifestation rates of cows to which was administrated a single dose of $\text{PgF}_{2\alpha}$ (67.1%) and heat manifestation rates at females to which were administrated two doses of $\text{PgF}_{2\alpha}$ (85.7-88.2%).

Key words: cow, synchronization protocols, $\text{PgF}_{2\alpha}$, estrous, artificial insemination

INTRODUCTION

Managers of large dairy cattle farms are aware of reproduction efficiency importance for maintaining the farms profitability. The most significant factors involved in reproduction efficiency in a dairy farm are: farm management, physiological and nutritional factors, disease and not at last, reproductive management [3].

In order to improve the rate of heat detection and to increase the pregnancy rate, most often are used hormonal programs to induce and synchronize the estrous. Estrous synchronization is a biotechnical method by which the artificial insemination can be performed for a high number of cows, in a certain interval [1].

The extensively used programs for estrous synchronization are using $\text{PgF}_{2\alpha}$ and their synthetic analogs. Prostaglandin estrous synchronization is based on the luteolyses effects which induces the functional regression of the corpus luteum, at 24-36 hours after administration [2].

The aim of our work was to induce and synchronize the estrous cycle in dairy cows,

to reduce the period from calving to conception, reducing the length of postpartum anestrus. To accomplish our aim we applied synchronization programs based on $\text{PgF}_{2\alpha}$ and their synthetic analogs.

MATERIAL AND METHODS

Cows with a normal evolution of the puerperal period were clinically monitored, by transrectal examination, in order to establish the ovaries activity and functional integrity of reproductive tract. Related to ovaries activity, females presenting a corpus luteum on one of the ovaries were considered with known estrous cycle (the luteal phase of estrus cycle). The rest of the females were considered in the category of females with unknown estrous cycle. Females from the experimental groups were synchronized with synthetic analogs of $\text{PgF}_{2\alpha}$ (Cloprostenol), using the following experimental protocols:

- Administration of a single dose of 500 μg Cloprostenol, to females with known estrous cycle, detection of females in heat in the next 5 days and A.I.;

- Administration of two doses of 500 μg Cloprostenol each, at 11 days interval, to females with unknown estrous cycle, heat detection after the second dose of Cloprostenol and A.I;
 - Administration of two doses of 500 μg Cloprostenol each, at 14 days interval, to females with unknown estrous cycle, heat detection after the second dose of Cloprostenol and A.I;
- Administration mode of synchronization protocols is presented in figure 1.

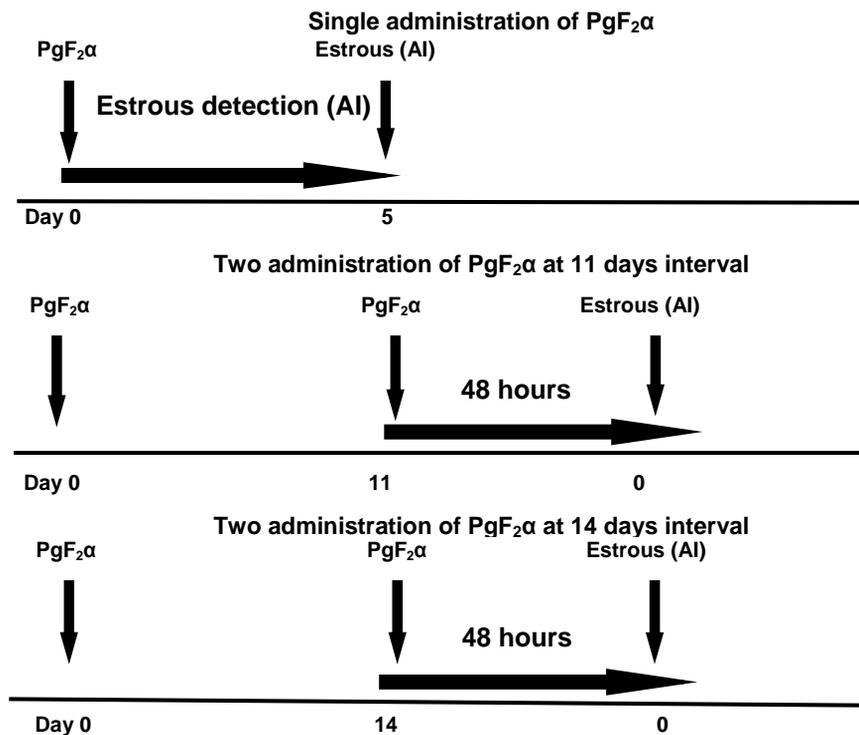


Figure1. Hormonal treatment protocols for estrous synchronization in cows

As a source of $\text{PgF}_2\alpha$ we used Prosolvin, in dose of 2 ml (500 μg Cloprostenol). To know more precisely the estrous onset, females were monitored starting 48 hours after $\text{PgF}_2\alpha$ administration 3 times a day (in the morning, at noon and late in the evening). Females were artificial inseminated when were detected in heats. At females treated with two doses of $\text{PgF}_2\alpha$ heat detection was performed only after the second administration.

RESULTS AND DISCUSSIONS

The results obtained were evaluated by the degree of heat manifestation grouping after hormonal stimulation.

In table 1 we presented results obtained in cow's estrous synchronization using 500 μg Cloprostenol (synthetic analog of $\text{PgF}_2\alpha$).

From the 70 females with known estrous cycle hormonal stimulated with a single dose of $\text{PgF}_2\alpha$, 47 (67.1%) manifested heats. From 42 females, to which two doses of $\text{PgF}_2\alpha$ were administrated, at 11 hours intervals, 36 (85.7%) manifested heats. From 51 cows, to which two doses of $\text{PgF}_2\alpha$ were administrated, at 14 days interval, 45 (82.2%) manifested heats. There were no significant differences ($p > 0.05$), in what concerns the heat manifestation rates, between cows to which two doses of $\text{PgF}_2\alpha$ were administrated, at 11 days interval (85.7%)

compared with the ones to which the PgF₂α was administered at 14 days interval (88.2%). The heat manifestation rates at cows treated with a single dose of PgF₂α (67.1%) was significantly different compared with females

treated with two doses of PgF₂α regardless of the time interval between administrations (85.7% (11 days interval) and 88.2% (14 days interval) respectively) (p<0.05).

Table 1
Results obtained after estrous synchronization with PgF₂α in cows

Specification	N	Females in heat		From within					
		n	%	48 h		72 h		96 h	
				n	%	n	%	n	%
A single administration of PgF ₂ α	70	47	67.1 ^b	15	31.9 ^a	23	48.9 ^b	9	19.1 ^a
Two administration of PgF ₂ α at 11 days intervals	42	36	85.7 ^a	10	27.8 ^a	22	61.1 ^a	4	11.1 ^a
Two administration of PgF ₂ α at 14 days intervals	51	45	88.2 ^a	13	28.9 ^a	28	62.2 ^a	4	8.9 ^a
Total	163	128	78.5	38	29.7	73	57.0	17	13.3

(a-a) p>0.05; (a-b) p<0.05

Regarding the time interval from the PgF₂α administration to the estrous onset, for the females treated with a single dose of PgF₂α, it can be noticed that, 15 (31.9%) cows manifested heats at 48 hours, 23 (48.9%) cows at 72 hours and 9 (19.1%) cows at 96 hours from the PgF₂α administration. From the females treated two doses of PgF₂α, at 11 days intervals, 10 (27.8%) cows manifested heats at 48 hours, 22 (61.1%) cows at 72 hours and 4 (11.1%) cows at 96 hours from the last administration of PgF₂α. From the females treated with two doses of PgF₂α, at 14 days intervals, 13 (28.9%) cows manifested heats at 48 hours, 28 (62.2%) cows at 72 hours and 4 (8.9%) cows at 96 hours from the last PgF₂α administration.

The statistical analyze of the results observed, shown no significant differences between the proportion of females manifesting heats, between the 48 and 96 hours, within the three experimental groups (p>0.05).

Significant differences were observed between females manifesting heats at 72 hours after PgF₂α: 48.9% females with one administration and 61.1-62.2% to females with two administrations of PgF₂α (p<0.05).

CONCLUSIONS

After hormonal stimulation with PgF₂α, females stimulated with a single dose of PgF₂α manifested heats in proportion of 67.1%, and females stimulated with two

doses of PgF₂α manifested heats in proportion of 85.7-88.20%, the differences were significant (p<0.05);

The time interval between the PgF₂α administration (11 days and 14 days) dose not influence significantly the proportion of cows manifesting heats after the second dose of PgF₂α (85.7% and 88.2%)(p>0.05);

The time interval between the PgF₂α administration (11 days and 14 days) dose not influence significantly the degree of heat grouping (61.1-62.2%) (p>0.05).

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