dilator fibres. No signs of intermittent release of transmitter substance from such degenerating vasodilator fibres could be found.

Zusammenfassung. Eine Vasodilatation erscheint in der Parotisdrüse der Katze gleichzeitig mit sekretorischer Aktivität (Degenerationssekretion oder Sekretion, hervorgerufen durch Stimulierung der Jacobsonschen Anastomose). Atropin blockiert die Vasodilatation im ersten, nicht aber im zweiten Falle. Das Resultat weist auf spezifische Vasodilatatoren hin.

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Fractions of Calving Interval and Reproductive Efficiency in Italian Friesian Cows

Introduction. The calving interval consists of two fractions: the service period and the length of gestation. The first fraction can be further subdivided into two others: (i) interval between calving and the first insemination and (ii) the interval between the first insemination and conception. The variation in the calving interval depends chiefly on the length of the service period. A reasonable shortening of the calving interval is an useful practice in cattle breeding. According to BETTINI[1], in order to reduce the calving interval, the length of gestation being constant, the service period has to be reduced by shortening the interval between calving and first insemination, as the second fraction of the service period involves the fertility of both females and males and their interactions. The time when the first heat appears after calving can vary within wide limits and is affected by the mammary gland. The work *in extenso*[2] reports the literature available on the factors influencing the length of the service period.

Material and Methods. The investigation refers to the data of 445 cows of Italian Friesian breed reared at S.A.B. Farm, Battipaglia (Salerno) from 1946 to 1960. Cows which have closed their career are 45.6% of the total. The interval between calving and the first insemination has been subdivided in classes of 20 days till 300 days, as appears in the Table. The investigation has been conducted separately for artificial insemination (A.I.) and natural service (N.S.).

Conclusions. (1) Both in A.I. and N.S. the average number of inseminations per conception seems to vary according to the length of the service interval. In N.S., the regression equation is $y_1 = 1.57180 + 0.01007\,x - 0.00003\,x^2$, where y_1 is the number of inseminations per conception and x is the service interval in days: the b value is highly significant ($P < 0.01$). Cows bred for the first time after 140–200 days from calving require larger number of inseminations per conception. In A.I. the regression equation is $y_2 = 2.66545 + 0.03149\,x - 0.00128\,x^2$. The b value is not significant, and the maximum number of inseminations per conception is within the interval of 80–160 days.

(2) In natural service, the relation between the service interval, the average length of the period from conception to abortion, and the percentage of abortions on the total number of abortions and on the total number of successful conceptions, is curvilinear (Figure). The number of inseminations per conception and the percentage of abortions on the total number of abortions have a similar tendency, whereas the percentage of the abortions on the total number of successful conceptions and the average length of the gestation period in those aborted have an opposite tendency. Because of the lack of sufficient data, an analysis in the animals inseminated artificially could

[1] T. M. BETTINI, Ann. Fac. Agr. Portici, Serie III *26*, 305 (1960–61).
[2] The paper will be published in detail in Produzione Animale *1* 17 (1962).

Inseminations, conceptions, number of inseminations per conception in relation to the interval between calving and first insemination, separately for the natural service (N.S.) and artificial insemination (A.I.)

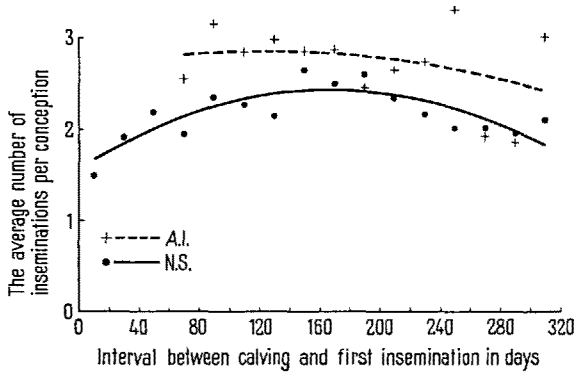
Interval between calving and first insemination (in days)	N.S.			A.I.		
	Number of services	Number of conceptions	Number of services per conception	Number of inseminations	Number of conceptions	Number of inseminations per conception
1– 20	3	2	1.50	—	—	—
21– 40	23	12	1.92	—	—	—
41– 60	57	26	2.19	8	1	8.00
61– 80	132	68	1.94	46	18	2.56
81–100	415	176	2.36	157	50	3.14
101–120	349	151	2.31	159	56	2.84
121–140	232	108	2.15	128	43	2.98
141–160	177	67	2.64	86	30	2.87
161–180	130	52	2.50	72	25	2.88
181–200	112	43	2.60	59	24	2.46
201–220	70	30	2.33	45	17	2.65
221–240	69	32	2.16	46	15	3.07
241–260	38	19	2.00	33	10	3.30
261–280	32	16	2.00	23	12	1.92
281–300	31	16	1.94	13	7	1.86
300 and above	73	35	2.09	42	14	3.00
Total	1943	853	—	917	322	—
Average	—	—	2.28	—	—	2.85

not be made. However, all the animals pooled together (A.I. and N.S.) show a similar tendency.

(3) The number of inseminations per conception and the percentage of abortions on the successful conceptions (in relation to the service interval) are negatively correlated ($r = -0.383 \pm 0.228$, $b = -4.19$).

(4) From the results obtained it might be concluded that the optimum service interval varies between 40 and 100 days.

(5) Further investigations, in order to understand better certain aspects of the problem in Italian Friesian breed and in other Italian breeds, are in progress.



Average number of inseminations per conception in relation to the interval in days between calving and first insemination.

Riassunto. In relazione alle frazioni dell'intervallo interparto è stata studiata l'efficienza riproduttiva nelle vacche (445 soggetti) di razza Frisona italiana, allevate in una grande azienda del Salernitano (Italia), come numero di inseminazioni per concepimento, come percentuale degli aborti sul totale di essi e sui concepimenti, e come lunghezza del periodo dal concepimento all'aborto.

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Weight of Rat Embryos after X-Ray Irradiation

It has recently been reported[1] that during the early stages of the mesoderm formation in rat, there is a great increase of resorption following x-ray irradiation.

We have thought it useful to carry on the analysis of unresorbed embryos during these stages of the rat development.

It is well known[1,2] that the incidence of gross malformations of the head shows a peak on day 9 after x-rays of 100 r. This way of expressing radiation effect cannot quantitatively evaluate the damage but only the degree of differentiation of an organ or an organ system.

On the other hand, the parameter of foetal weight appears, according to BRENT[3], to be a very sensitive measurement of radiation effect, and for this reason we tried to use it in our analysis.

The method of x-ray irradiation is already described elsewhere[1]. However, it is necessary to point out that in these experiments only the embryos of one uterine horn were irradiated with 100 r, the other horn being shielded by lead plates and serving as control[2]. All treated animals were killed on the 15th day of pregnancy and the embryos weighed after the fixation in Bouin's mixture.

From Table I it is readily seen that in all irradiated groups the mean foetal weights are significantly lower than in controls (the '*t*' test). The coefficient of variation is higher in irradiated groups than in controls.

The differences in the weight of different groups, either irradiated or controls, are shown by the analysis of variance (Tables II–IV).

The control group represents a homogeneous sample of the 15th day rat embryos, while the irradiated groups show a significant difference between the groups. If the $8^1/_2$ and 9 day embryos are excluded, the mean weights of irradiated embryos also become homogeneous. The $8^1/_2$ and 9 day embryos seem to be very sensitive to x-rays because the irradiation damage appears greater than on other days analysed.

Several authors have observed that the onset of the mesoderm formation begins during the 9th day of rat pregnancy, which is in complete agreement with our data.

As regards the cause of their sensitivity during the mesoderm formation, we tried to analyse the mitotic activity of rat embryos on the 7 and $8^1/_2$ days. The dif-

Table I. Foetal weights in mg

Day of gestation	Irradiated N	$\bar{X}$	C.V.%	$\sigma_{\bar{x}}$	Control N	$\bar{X}$	C.V.%	$\sigma_{\bar{x}}$	t
5	49	95.5	21.99	3.000	66	114.470	15.72	2.215	5.084
6	38	90.5	27.36	4.017	68	118.603	11.33	1.629	6.477
7	61	91.2	22.00	2.570	74	115.541	14.37	1.930	7.562
$7^1/_2$	68	86.9	25.52	2.689	89	115.112	18.54	2.263	8.023
8	46	83.9	32.76	4.053	87	115.172	15.89	1.963	6.942
$8^1/_2$	23	74.7	28.76	4.484	94	119.841	16.67	2.061	9.130
9	54	78.3	29.58	3.153	71	114.437	13.01	1.768	9.987
$9^1/_2$	39	91.5	25.59	3.752	73	113.356	11.76	1.561	5.730
10	72	91.9	22.14	2.399	80	111.188	13.48	1.676	6.574

Table II. Analysis of variance of all irradiated groups

	Sums of squares	Degrees of freedom	Mean square	Variance ratio	*P*
Between groups	15163.94	8	1895.4925	3.734	<0.01
Within groups	223891.00	441	507.6893		
Total	239054.94	449			

[1] N. ŠKREB and N. BIJELIĆ, Nature (Lond.) *193*, 292 (1962).
[2] J. G. WILSON, J. cell. comp. Physiol. *43*, Supp. 1, 11 (1954).
[3] R. BRENT, Amer. J. Dis. Child. *100*, 103 (1960).