studies at the 10^{-4} M concentration. For inhibition of lens aldose reductase (bovine) in vitro, levels of 10^{-5} M and 10^{-6} M were effective, and 10^{-4} M was inhibitory in a lens tissue culture system (rabbit)[11]. In the system employed in the present studies, the prostaglandin analog 13-hydroxy-9-oxoprost-14-ynoic acid was an effective antagonist at 5×10^{-4} M, but not at 5×10^{-5} M[17].

Due to its ability to antagonize the action of prostaglandin to cause cyclic AMP accumulation, alrestatin is of potential relevance in various areas depending upon its specificity of action. In this regard the 7-oxa-13-prostynoic acid inhibits the release of various hormones, e.g., adrenocorticotropic and thyroid stimulating hormones by their respective releasing factors[19] and growth hormone by prostaglandin[16] in hemipituitaries in vitro. Alrestatin is of interest with respect to its ability to inhibit the aldose reductase which results in decreased levels of polyols in galactosemic and diabetic rats[11]. Among the possible effects of alrestatin on hormone release is that on glucagon release. Such an action would be independent of aldose reductase inhibition but could be complementary.

The specificity of the antagonism by alrestatin is of interest in relation to the different actions of prostaglandins, species and tissues, and other agonists as well as are the other possible physiological and pharmacological activities of alrestatin.

It is of importance that somatostatin has been demonstrated to antagonize various hormonal secretions, e.g. in humans, among these being glucagon, insulin, growth hormone, prolactin and gastrin[20]. Further, gastric acid secretion has been observed to be antagonized by somatostatin in humans[20]. Recently, somatostatin has been found to inhibit gastric acid secretion in the rat[21]. In this regard, it is of interest that alrestatin has also been found to inhibit gastric acid secretion in the rat[22].

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Possible relationship between packed sperm volume and egg mass in domestic fowl

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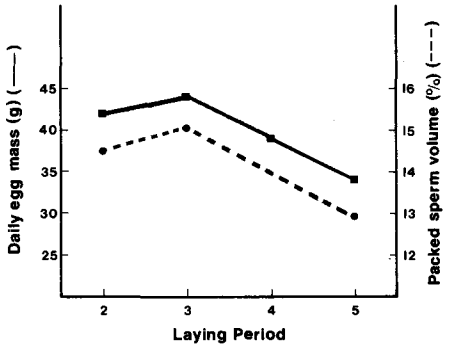
Summary. Packed sperm volume (PSV) values of male chickens have been observed to parallel the daily egg mass values of laying hens. Selection progress was greater when selection was for PSV and egg mass than for egg mass alone.

Some important economic traits in livestock production such as milk yield in dairy cattle and egg production in the domestic fowl are sex limited. This limitation precludes reliable means other than progeny and sib tests of estimating the corresponding genotype in the opposite sex. Consequently, the genetic progress for the improvement of these traits is less than that of traits measurable in both sexes. This situation often applies to reproductive traits and results in a lower selection intensity for the sex-limited trait. Egg production in the domestic fowl is an example of a trait that fails to respond to mass selection after initial gains, and further improvement requires either progeny testing or sib selection[1]. Because these selection systems are more complex and time consuming than mass selection, the development of a procedure involving individual phenotypic selection in both the male and female would be desirable.

We have initiated studies to investigate possible methods of improving reproductive efficiency in laying hens by applying selection pressure to both males and females. The advantage of using egg mass (egg number × egg weight) as a biological selection index has received little investigation[2]. The establishment of a parameter such as egg mass as the criterion for selection to improve egg production efficiency may allow the identification of a possible corollary in the male. If egg mass is defined as the total reproductive mass produced by the female (composite of both egg size and number), then the packed cell volume of semen could represent a corresponding unit in the male, assuming that gonads of both males and females are subject to control by common neuroendocrine systems. Although little attention has been devoted to the male's role in improving egg production of the domestic fowl, semen production and egg production are related in White Leghorns as evidenced by selection for high and low

fecundity[3]. Total semen volume, however, may not be an accurate measure of total cell mass because approximately 75% of its volume is a supernatant fluid[4].

Our procedure involved the collection of egg mass data from 400 females for 5 28-day periods starting at 154 days of age. Individual egg records were recorded for 5 periods; mean egg weights were obtained from eggs collected during the 2 week of each period. Daily egg mass was defined as the total egg mass produced during the 140-day period divided by the days after females reached sexual maturity. Semen samples were collected[5] from 146 males during the 2nd, 3rd and 5th laying periods. Triplicate samples of each male's semen were placed in micro hematocrit tubes and centrifuged at 12,000 to 15,000 rpm for 3 min, and then packed sperm volume (PSV) percentages were read on a micro capillary reader. The mean PSV values of males were observed to parallel the mean daily egg mass curve of full sib females (figure) in the 2nd, 3rd and 5th laying periods. The levels of both PSV and egg mass were highest in the 3rd laying period and lowest in the 5th period.



Mean daily egg mass of females and packed sperm volume of male sibs.

Daily egg mass of females and packed sperm volume of males by line

Line	Daily egg mass Generation S_0	S_1	S_1-S_0	Packed sperm volume Period 3	5
	(g)	(g)	(g)	(%)	(%)
EMS1	39.89	46.64	6.75	16.79	12.36
EMS2	41.18	45.22	4.04	14.03	12.05
$\bar{x}$	40.54	45.93	5.39	15.41	12.21
EMR1	42.30	44.19	1.89	13.31	10.68
EMR2	40.29	42.77	2.48	13.34	10.60
$\bar{x}$	41.30	43.48	2.18	13.32	10.64

In tests to investigate possible genetic ramifications of these observations, males with both intermediate and high PSV and females with high egg mass were utilized to establish 4 selected lines. 2 replicate lines (EMS1 and EMS2) were established by mating 6 males/line with high PSV values with 24 females/line with high egg mass values; and 2 replicate lines (EMR1 and EMR2) were established by mating 6 males/line with intermediate PSV values with 24 females/line with high egg mass values. The mean daily egg masses of females from the 2 lines mated to intermediate males (EMR1 and EMR2 lines) were 1.89 and 2.48 g greater in the S_1 generation than in the S_0 (base) generation (table). Contrariwise, the selection gains in the S_1 generation obtained in lines (EMS1 and EMS2) in which males were selected for high PSV values and females were selected for egg mass were 6.75 and 4.04 g greater than corresponding values in the S_0 generation. The average gain in daily egg mass across replications was twice as great for EMS lines (5.39 g) as for the EMR (2.18 g) lines (table). The magnitude of this difference may be important because selection in the EMR lines was for only females, whereas selection in the EMS lines was for both sexes. Therefore, the EMS lines may have had the equivalent of twice the selection pressure the EMR lines had.

The mean PSV of S_1 generation males in the EMS1 and EMS2 lines were higher than corresponding values of males in the EMR1 and EMR2 lines in both period 3 and period 5 (table). These findings indicate an apparent response to selection in PSV. These data suggest a close relationship between neuroendocrine systems involving PSV in the male and egg mass in the female. This information may prove to be a valuable selection tool because of the intense selection pressure that could be applied to males when selection is for a sex limited trait.

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A chromosome study of the parthenogenetic rice water weevil, *Lissorhoptrus oryzophilus* Kuschel (Coleoptera: Curculionidae), in Japan

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Summary. The chromosomes of the so-called rice water weevil, *Lissorhoptrus oryzophilus* Kuschel obtained from Tokoname City, Aichi Prefecture, were studied in both oogonial and oocyte-maturation divisions in squash and sectioned slides, respectively. The chromosome number was confirmed as exactly 33 in both divisions. No reduction division takes place. It is therefore concluded that *Lissorhoptrus oryzophilus* is a parthenogenetic triploid in Tokoname City.

The rice water weevil, *Lissorhoptrus oryzophilus* Kuschel, a member of the tribe Hydronomi, subfamily Curculioninae (Lissorhoptrinae) is known as a serious rice pest in North America. In the USA both males and females abound in most areas; in California, however, only female insects are found. In the early spring of 1976, farmers found peculiar small weevils in paddy-fields located in the so-called Maeyama area (formally, Hattanda, Kanayama), Tokoname City at Chita peninsula, Aichi Prefecture, Japan. Immediately, staff of the Ministry of Agriculture, Japan, began detailed research on the weevil species. Some specimens were sent to Dr G. Kuschel in New Zealand for