The mechanisms involved are unknown at the present time, but it seems likely that they are different in the birds studied here than in the rat. Zarrow and Zarrow (*2*) have suggested that in the rat the athyroidic condition reduces the adrenocorticotrophic activity of the pituitary which results in the observed adrenal atrophy in this species. The hypertrophy reported here in the chick involves weight studies of the entire gland. It is still possible that the interrenal tissue was atrophied, which would perhaps indicate decreased adrenocorticotrophic activity of the chick pituitary as in the rat. Preliminary histological examination, however, did not reveal any degeneration of the interrenal cells. These studies are being pursued further in an attempt to clarify this aspect of the problem. An attempt to study the activity of adrenals from thyroidectomized and thiouracil-treated birds is being made by an analysis of the ascorbic acid and cholesterol content of such glands. It is also planned to investigate the adrenocorticotrophic activity of the pituitaries from such birds.

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Manuscript received July 7, 1952.

Flocculence in Yeast[1]

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The yeast *Saccharomyces cerevisiae* has two typical growth habits in liquid shake culture: (*a*) as a homogeneous disperse suspension consisting of single cells or cells with 1–2 buds and (*b*) as a noticeably particulate, nondisperse suspension consisting of clumps of cells of varying number. There is good agreement among the geneticists who have studied this character that it is under genetic control (*1–3*). There seems, however, to be some question as to which type of growth habit is dominant in a heterozygote. Pomper and Burkholder (*1*) reported that the disperse habit was dominant over the nondisperse, under specified conditions. Roman *et al.* (*2*) and Thorne (*3*) have since reported that flocculence is dominant over nonflocculence. It seems desirable, in an effort to resolve this apparent difference, to amplify the statement (*1*) that heterozygous diploids may be flocculent or nonflocculent depending on cultural conditions.

In our experience with this character, at least three external factors have been found to influence the expression of the "dominant" allele in a heterozygote: (*a*) time when scored, (*b*) carbohydrate used, and (*c*) concentration of the sugar. In the present study, six cultures were used. Three were diploids heterozygous for a single gene pair controlling the character; one was a triploid (*4*) heterozygous for the character (two alleles of disperse to one of nondisperse); the fifth was a diploid homozygous for the disperse allele; and the sixth was a diploid homozygous for the nondisperse (flocculent) allele.

A synthetic medium (*5*) at pH 6.8 was used, employing a standard inoculum (*6*) and rotating the tubes continuously in a 30° C constant-temperature room. The medium was prepared without any carbohydrate source, and tubed at twice the desired final concentration. Filter-sterilized solutions of the sugars were added aseptically to the medium after autoclaving, and the final volume was adjusted to 5 ml. The data obtained with the heterozygous diploids, a triploid, and two homozygous diploids are shown in Table 1. It should be noted that the haploid components of these hybrids show no dependence upon cultural conditions; i.e., a flocculent haploid remains flocculent and a nonflocculent haploid remains nonflocculent under all test conditions examined.

[1] Work performed under Contract No. W-7405-eng-26 for the Atomic Energy Commission.

TABLE 1

VARIATION IN YEAST GROWTH HABIT

Carbohydrate (%)		Growth Habit*							
		Heterozygous diploid†		Heterozygous triploid‡		Diploid homozygous for nonflocculence		Diploid homozygous for flocculence	
		1 day	2 days	1 day	2 days	1 day	2 days	1 day	2 days
Glucose	1	nf	nf	nf	nf	nf	nf	f	f
	5	"	f	"	sf	"	"	"	"
Fructose	1	sf	"	"	nf	"	"	"	"
	5	f	"	sf	f	"	"	"	"
Maltose	1	nf	nf	nf	nf	"	"	sf	"
	5	"	f	"	f	"	"	"	"
Sucrose	1	"	nf	"	sf	"	"	f	"
	5	"	f	"	"	"	"	"	"

* nf = nonflocculent—i.e., disperse; f = flocculent; and sf = slightly flocculent (in appearance a mixture of both f and nf).
† Essentially the same results were obtained with the three heterozygous diploids tested. All three cultures segregate 2 : 2 for nf and f types.
‡ The triploid was composed of an f haploid with a homozygous nf diploid.

It is clear from the data in Table 1 that, depending on the time, the carbon source and its concentration, the expression of flocculence may be variable in heterozygotes. The probability of scoring flocculent as dominant over nonflocculent increases with time of incubation and carbohydrate concentration. It seems unlikely that the results are due to selection of a mutation from heterozygosity to homozygosity (for nonflocculence), since the cultures were originally isolated on glucose-containing agar, have been maintained on glucose stock agar, and yet segregate regularly for flocculence and nonflocculence. It seems reasonable to conclude that the difference in results cited in the opening paragraph is due, in part at least, to the different experimental conditions employed,[2] as well as to possible genetic differences in the stocks used. The data in the present paper are a good example of an environmental effect on dominance relationships in heterozygotes.

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Manuscript received July 2, 1952.

[2] We have confirmed with our stocks the findings of Roman *et al.* (2) that heterozygotes grow flocculently in Difco yeast nitrogen base medium with 1% glucose. The physiological basis of flocculence may become more apparent when the factor determining its expression or lack of expression in these media is resolved.

Food Intake and Hepatic Vitamin A in Castrated Mice

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The fact that castration is accompanied by significant increases in liver vitamin A stores (*1–3*) has been adequately confirmed. It is not known, however, whether this effect is due to increased ingestion of food by the experimental animal. This question has arisen repeatedly in studies of this nature, and an investigation of the problem is long overdue.

It is apparent that determinations of the food intake and body weight of the animals are essential, especially in work involving vitamin A. An integral part of the problem is an analysis of the laboratory diet for vitamin A content to ascertain whether changes in food intake might account for proportional differences in hepatic levels of the vitamin.

Fifty-nine C_{57} mice were divided into intact and castrated groups, and placed on an *ad lib* diet of Purina fox chow, which was ground to form a coarse powder and distributed in weighed feeding cups. The food intake of pairs of mice from each group was determined for 4 days; these animals were then returned to the respective series, and other pairs were placed in the feeding boxes. These determinations were made throughout the period of study. The vitamin A content of 4 samples of each batch of diet was determined during this time.

Body weight was recorded for each animal immediately prior to autopsy, at which time liver samples were analyzed for vitamin A content by the antimony trichloride method, using a Klett-Summerson colorimeter.

The content of vitamin A of each batch of diet was relatively consistent, with extremes of 1.5–1.8 IU/g; the average of all batches was 1.6 IU/g.

Even under very carefully controlled conditions, the measurement of food intake per animal per day is unsatisfactory. The general average, however, was remarkably consistent and showed no striking differences between the two groups; it is obvious, furthermore, that a significant influence of food intake on the recorded levels of vitamin A (Table 1) could be achieved only by relatively enormous differences in the amount of diet ingested. Body weight averages confirm the lack of differential food intake as a determining factor in the results of this study.

TABLE 1

No. animals		Age in days	Food intake (g/mouse /day)		Body wt (g)		Vitamin A (IU/g)	
I*	C*		I	C	I	C	I	C
12	8	80	1.8	2.0	23.3	18.2	367	914
11	8	120	2.6	2.8	21.5	21.1	846	1173
12	8	180	3.1	3.5	26.8	23.7	459	1180

* I = intact; C = castrated.

Table 1 illustrates clearly the marked increase in liver stores of the vitamin in castrated mice. It is patently inconceivable that a threefold change in vitamin A content is due to a difference of .2–.4 g diet/mouse/day. That these values are not peculiar to the period studied is amply demonstrated in the results of long-term experiments to be published shortly.

The factors responsible for the increased levels of hepatic vitamin A in castrated rats and mice are unknown. Differences in absorption, utilization, and destruction of the vitamin, although of doubtful significance because of the relatively small amount ingested, require systematic study. Similarly, shifting of the minute stores from other parts of the body to the liver could not account for the marked changes reported. All these factors, however, must receive intensive investigation.

The suggestion that food intake may have a significant influence on the vitamin A stores of castrated