killing; fourth, the rate of cooling of mice killed by percussion was not slower than that of the same mice after being reheated about 2 hr later.

A comparison of rectal and average temperatures for resting albino mice held 1 to 2 hr at various environmental temperatures (0°, 10°, 20°, 30°, and 40° C) is shown in Fig. 1. After each mouse had become

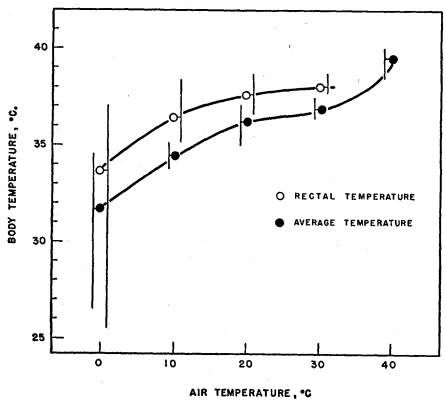

FIG. 1. The effect of environmental temperature on average body temperature and on rectal temperature.

quiet again, following removal of the thermocouple wires, it was killed by percussion and immediately placed in a calorimeter. These tests showed that both rectal temperatures and average body temperatures were relatively constant over only a small range of environmental temperatures. At each environmental temperature, rectal temperatures averaged 1° to 2° C higher than average temperatures, and the difference tended to be greater at lower air temperatures. The range of both average and rectal temperatures is shown by vertical lines in Fig. 1. This variation increased enormously at 0° C.

Determinations of rectal and average body temperatures have also been made on mice running in a treadmill at 10° and 30° C. At 10° C rectal temperatures ranged from 34.2° to 38.0° (averaging 36.2° C), whereas average temperatures of the same mice ranged from 31.1° to 35.5° (averaging 33.8° C). At 30° C rectal temperatures ranged between 40.7° and 44.0° (averaging 42.1° C), whereas average temperatures varied from 39.4° to 42.5° (averaging 40.1° C). It is evident that at 10° C there was very little difference in body temperatures during rest and activity; but at 30° C rectal temperatures averaged 4.0° and average body temperatures 3.5° C higher than corresponding values during rest. This behavior of body temperature during activity differed from the behavior of metabolism (7), which has been found to increase by approximately the same amount at different temperatures for the same degree of activity.

For mice chilled to the point of death, rectal temperatures gave no indication of average body temperatures. In 8 mice rectal temperatures at death varied from 5.0° to 14.5° C, but average temperatures were always higher than rectal temperatures by amounts ranging from 0.4° to 4.3° C. Evidently the rectal region cools to a greater extent than other regions of the body under these conditions.

Average body temperature determination is useful as a research tool for supplementing other temperature measurements in mice and possibly other animals. A major disadvantage is that a series of measurements cannot be made on the same animal. For this reason, the method is perhaps most applicable to lethal temperature studies, but it can be applied in other studies when large numbers of animals are available.

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Cow Feces and Chick Development

H. W. Marlow[1, 2]

Department of Biochemistry,
Southwestern Medical College, Dallas, Texas

An extract of pregnant cow feces gave Rubin and co-workers (*1*) a chick growth factor. Hot water, 50% alcohol, or 95% alcohol extracted appreciable quantities of this factor. These workers also found (*2*) that their factor was soluble in 50% acetone and that it could be extracted with ammoniacal alcohol. It is stable to autoclaving at neutral pH, but is rapidly destroyed by autoclaving with 2*N* HCl. It may be precipitated by adjusting the pH to 3. Whitson and others (*3*) also extracted from cow manure a chick growth factor not identical with any known growth vitamins. Turner (*4*) and Riley *et al.* (*5*) not only demonstrated the presence of a chick growth factor in pregnant cow feces but of an orally effective androgen as well. McGinnis *et al.* (*6*) believe that the growth factor can be synthesized in hen feces upon incubation at 30° C for 72 hr.

Agreement as to the existence of a chick growth factor appears to be universal. It seemed desirable to explore the field further by studying the effects of an alcoholic extract of the feces on the comb size and body weight of young chicks of both sexes and on the testis size of male chicks.

Feces from pregnant cows were extracted 3 times with 95% alcohol in the cold by agitation. The alcohol was filtered off, and the alcohol-insoluble fraction was dried in a warm place and ground fine. Twenty per cent weight of the extracted feces was added to 80% of Purina growing mash. A preliminary experiment was devised as follows: One lot of single-comb White Leghorn male chicks was started on Purina growing mash as a control, and another lot was started on the

[1] Present address: Veterans Administration Hospital, McKinney, Texas.

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TABLE 1

EFFECT OF FEEDING DRIED AND EXTRACTED FECAL MATERIAL

Male Chicks

Lot No.	No.	Av body wt (g)	Av comb wt (mg)	Av testes wt (mg)	Comb		Comb body wt	Testes body wt	Testes comb wt
					L (mm)	*H* (mm)			
1	22	128	504	31	29	13	3.94	.242	.0615
3	20	97	135	22	21	8	1.39	.227	.1630
5	7	148	553	40	27	13	3.74	.270	.0723
7	9	155	698	37	32	14	4.50	.239	.0530
8	9	150	732	45	32	16	4.88	.300	.0614

Initial av wt was 37.9 g.
Significant *t* values at .01 level:
Body wt: 1 & 3; 1 & 7; 1 & 8; 3 & 5; 3 & 7; 3 & 8.
Comb wt: 1 & 3; 1 & 8; 3 & 5; 3 & 7; 3 & 8.
Testis wt: 1 & 8; 3 & 5; 3 & 7; 3 & 8.
Comb wt/body wt: 1 & 3; 3 & 5; 3 & 7; 3 & 8.

Female Chicks

Lot No.	No.	Av body wt (g)	Av comb wt (mg)	Av uterus wt (mg)	Comb		Comb body wt	Comb body wt	Uterus comb wt
					L (mm)	*H* (mm)			
2	20	135	85	—	20	6	.634	—	—
4	20	88	41	—	15	4	.466	—	—
6	6	185	169	37	23	9	.913	.200	.0219
7	12	146	133	29	21	7	.911	.199	.0218
8	8	140	177	29	20	8	1.264	.207	.0164

Initial av wt was 38.6 g.
Significant *t* values at .01 level:
Body wt: 2 & 4; 2 & 6; 4 & 6; 4 & 7; 4 & 8; 6 & 8.
Comb wt: 2 & 4; 4 & 6; 4 & 7; 4 & 8.

above mixture. The feeding was continued until the chicks were 35 days old. The chicks were then sacrificed, their combs weighed and measured, and their wattles and testes also weighed. A significant loss of body and comb weight and a marked though nonsignificant decrease in size of the testes were noted in the groups (Lots 3 and 4) fed on the mixture containing the extracted feces.

A more conclusive experiment was set up to use both sexes. Topical application of the extracts from the fecal material and bile was made to Lots 7 and 8, respectively. The lots may be described as follows:

Lot 1—25 male chicks fed 100% Purina growing mash
Lot 2—25 female chicks fed 100% Purina growing mash
Lot 3—25 male chicks fed 80% growing mash and 20% alcohol-extracted feces
Lot 4—25 female chicks fed 80% growing mash and 20% alcohol-extracted feces
Lot 5—25 male chicks fed 80% growing mash and 20% unextracted but dried feces
Lot 6—25 female chicks fed 80% growing mash and 20% unextracted but dried feces
Lot 7—13 male and 13 female chicks fed 100% growing mash with topical application to the comb of an alcoholic extract from fecal material
Lot 8—13 male and 13 female chicks fed 100% growing mash with topical application to the comb of a purified extract of bile from pregnant cattle (3 ml equivalent/day)

Table 1 gives the information obtained at the end of the 28-day feeding test.

Both male and female chicks fed on a 20% level of extracted feces showed a significant decrease in body and comb weights, both with respect to the controls and with respect to those groups that had feces extract or bile applied to the comb. In the males, the decrease in testicular weight, although considerable, was not significantly different from the controls but was from the larger testes of Lots 5, 7, and 8. Comb weight was reduced relatively more than body weight.

When the male chicks were fed on a normal growing mash with topical application of extracts of feces (Lot 7) or bile (Lot 8) from pregnant cattle, both groups showed a significantly greater body weight, and Lot 8 showed a significant increase in combs and testes.

When female chicks were fed on a 20% level of unextracted but dried feces (Lot 6), significant increases were noted in both body weight and comb size. The males showed similar increases, but these were not significant.

Since the groups that were fed 20% dried unextracted feces actually gained some weight over the controls, it seems apparent that the changes in those receiving extracted feces are due to removal of the alcohol-soluble fraction containing mainly the growth factor which causes increased comb growth.

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