

**VII. A STUDY OF THE EFFECT OF COCA-COLA ON THE BASAL
METABOLISM OF COLLEGE WOMEN AND ADOLESCENT GIRLS**

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The purpose of the problem under consideration was to study the effect of Ooca-Cola on the energy production of adult college women and adolescent girls. Consequently, two groups, one of adult college women and one of adolescent girls, were used to secure the data herein reported.

The general plan followed in this study was: (1) the basal metabolism was determined, (2) Coca-Cola was given, and (3) the metabolism was measured after one-half hour, and again at one hour. Ten normal college women and ten adolescent girls acted as subjects.

Women 18 to 31 years of age were used. Those who were within the range of 10 percent above or below the standard weight for height and age were considered normal. So far as could be ascertained, all of these were in good physical condition. Only four of the subjects drank Coca-Cola

habitually; the remaining six drank it only occasionally. Each of the ten adolescent girls, 10 to 13 years of age, were within the range of 10 percent above or below the normal weight for height and age and were considered normal.

The Aub-DuBois standards, lowered 5 percent as suggested by Benedict, were used as the basis of comparison for college women. The Benedict-Talbot standards were used for the adolescent girls.

Each subject came to the laboratory between 6 and 8 o'clock in the morning, having omitted breakfast and without having taken any exercise other than that of arising, dressing, and walking to the laboratory. The test was taken 12 to 14 hours after the last intake of food. In the adults, the menstrual period was avoided. The subjects were made comfortable, and on the first trip to the laboratory the apparatus was explained to them in order to avoid any anxiety on their part. Quiet was maintained in the laboratory at all times, and talking, except when necessary, was not permitted. The subjects were completely relaxed during the rest period of 30 minutes. Before each test, the mouth temperature of the subject was taken in order to rule out any discrepancies caused by fever. The pulse of the subject was counted at 5 minutes intervals during the rest period, and from 2 to 3 minute intervals during the test period. Following this, the basal metabolism was measured during two successive periods of about 7 to 9 minutes each, with an intervening rest period of from 4 to 5 minutes. These two periods checked within 5 percent, or the record was discarded. The average of these two periods was taken as that observation. This was repeated another day, and the averages for the two days were compared. These agreed within 10 percent in all but two cases.

Immediately upon the completion of the basal metabolism test, a standard glass of Coca-Cola containing one ounce of Coca-Cola sirup purchased from a local soda fountain was ingested. A standard glass contained by measure:

Coca-Cola sirup -----	29.5 c. c.
Tap water -----	200.0 c. c.
	229.5 c. c.

The Coca-Cola as given was measured each time in a 100 c. c. graduate. This is recognized as being not so nearly accurate as weighing. As a check on the accuracy of the measuring, the experimenter measured and weighed several times the amounts of Coca-Cola given and of water used. A variation from 30 to 34 grams for the Coca-Cola and from 208 to 212 for the water was found in each ten times of measuring. The average amount then of Coca-Cola given was 31.6 grams and of water 209.7 grams.

A practically uniform amount of chipped ice was served in each glass, and in each case, the entire amount of liquid was taken. Following another rest period of 30 minutes, the metabolism was measured as before during two successive periods of about 7 to 9 minutes each. At the end of an hour after the ingestion of Coca-Cola, the metabolism was measured as previously during two more successive periods. In the beginning of the investigation, tests were made at later intervals; but since in every case the highest point of stimulation seemed to have been passed before 60 minutes after ingestion of Coca-Cola, this practice was discontinued.

The basal metabolism of the college women ranged from -19.1 percent to -2.2 percent, with a deviation from the standard of -9.3 percent. Thirty minutes after the ingestion of Coca-Cola the stimulation ranged from 5.6 percent to 19.1 percent, giving an average stimulation of 11.3 percent. The energy production, one hour after the ingestion of Coca-Cola, gave an average of 0.94 percent above the average basal metabolism, ranging from -3.5 percent to 10.3 percent.

The adolescent girls had an average basal metabolism of 4.6 percent above the standard, their range having been from -9.5 percent to 16.9 percent above the standard. Thirty minutes after the ingestion of the Coca-Cola, a stimulation showed in all cases, the range of variation being from 0.43 percent to 11.3 percent, with an average of 4.9 percent. An hour afterwards, the energy production ranged from 3.2 percent above the basal metabolism as measured to 8.1 percent below the basal metabolism as measured, giving an average of -1.23 percent.

It was noted that the average results for the two groups were somewhat similar 30 minutes after ingestion of Coca-Cola, a stimulation showing in both cases. However, one hour after, the average results differed, there being a slight depression among the adolescent girls, while the average results for the young women presented no such data.