Bran—1 square, or mayonnaise or oil—2 teaspoons; Milk—1 cup.

Dinner:
Lean meat, fish or fowl—1 medium serving (1/4 pound raw); Potato—1 small (size of egg), or bread—1 slice, or noodles, rice, corn, or beans—1/2 cup; Vegetables—2 generous servings (2 cups); Butter—1 square; Fruit—1 serving.

One serving fruit: 1/2 grapefruit, 1 small orange, 1 cup fresh berries, (no loganberries), 1/2 cantaloupe, 1/2 slice watermelon (11/2 inches thick), 3 apricots, 1 small peach, 2 plums, 2 thin slices fresh pineapple, 1/2 medium apple, 3 nectarines, 1/2 medium pear, 2 figs, 1/2 banana, 1 cup grapefruit juice, 1 cup tomato juice, 1/2 cup orange juice, 1/2 cup pineapple juice, 1/2 cup dried cooked apricots or prunes (when stewed without sugar).

May take: Clear soup, plain tea or coffee with any meal. Saccharin (1/4 grain) may be used for sweetening, if desired. Any kind of bread may be used, but only in the amounts specified.

Avoid: Sweets, such as sweetened canned fruit, honey, sugar, all desserts, and fruits which are not listed here. It is important not to eat larger helpings than those listed here.

III. Diet: 2062 Calories
Carbohydrates 220 Gm.; Protein 93 Gm.; Fat 90 Gm.
Breakfast:
Fruit—1 serving; Cereal—3 tablespoons (dry measure before cooking); Milk—1 standard measuring cup (or 1/2 cup canned milk); Bread—1 slice; Butter—1 pat; Egg—1.
Lunch:
Meat, fish or cheese or eggs—1 small serving (1/4 pound = 2 oz.); Vegetables (raw or cooked)—1 generous serving (1 cup); Bread—2 slices; Butter, mayonnaise, or oil—2 pats, or 4 teaspoons; Fruit—1 serving; Milk—1 cup.
Dinner:
Lean meat, fish or fowl—1 medium serving (1/4 pound raw); Potato, or bread—1 medium, or 2 slices; Vegetables (raw or cooked) except corn, beans, peas—1 generous serving (1 cup); Butter, mayonnaise, or oil—2 pats, or 4 teaspoons; Fruit—1 serving.
One serving fruit: 2 oranges, or 1 cup juice, 1 large grapefruit, or 1 cup juice, 1 small cantaloupe, 2 cups fresh berries, 1 slice watermelon (2 inches), 7 apricots, 1 large peach, 1 slice canned (sweetened) pineapple, 1 cup pineapple juice, 6 plums, 1 apple, 1 medium bunch grapes (1/2 pound), 6 nectarines, 1 pear, 30 cherries, 4 figs, 1 small persimmon, 1 banana, 5 prunes, or 1/2 cup stewed dried fruit (cooked without sugar).

Instead of one serving fruit, 1/2 cup of jello, custard or junket may be used occasionally.

instead of 1 medium potato, the following may be used:
1 cup green peas, 2 medium ears fresh corn or 3/4 cup canned corn, or 3/4 cup cooked beans, rice noodles or macaroni.

May take: Clear broth, plain tea or coffee with any meal. Saccharin (1/4 grain) may be used for sweetening, if desired.

Avoid: Sweets, such as sweetened canned fruit, honey, sugar, and desserts.

Eat all listed for breakfast, lunch and dinner, but only in the amounts prescribed.

IV. Diet: 2550 Calories
Carbohydrates 295 Gm.; Protein 95 Gm.; Fat 110 Gm.
Breakfast:
Fruit—1 serving; Cereal—2 tablespoons, or fruit—1 extra serving; Milk—1 standard measuring cup (or 1/2 cup canned milk); Bread—2 slices; Butter—2 pats; Egg—1.
Lunch:
Choice of:
1. Meat or cheese or egg—1 slice, or 1; Vegetables (except potatoes, corn, peas, beans)—1 cup; Rice or noodles—3/4 cup; Bread—2 slices; Butter—2 pats, or oil or mayonnaise—3/4 cup.
2. Macaroni and cheese or similar creamed dish; or canned beans, lima beans, peas or corn—1/2 cup; Vegetables (except as noted above)—1 cup; Bread—2 slices; Butter—2 pats, or oil or mayonnaise—4 teaspoons.
3. Meat or cheese or egg—1 slice, or 1; Vegetables, raw or cooked (except as noted above)—1 cup; Bread—4 slices; Butter—2 pats, or oil or mayonnaise—4 teaspoons; Fruit—1 serving; Milk—1 cup.
Supper:
Lean meat, fish or fowl—1 medium serving (1/4 pound raw); Potato—1 medium or bread—2 slices; Vegetables (except as noted above)—1 cup; Butter—1 pat; Salad oil or mayonnaise—1 tablespoon; Milk—1 cup; Fruit—1 small serving or occasionally ice cream pudding or unfrosted cake.

Bedtime nourishment:
Fruit—1 serving.
One serving fruit: 2 oranges, or 1 cup juice, 1 large grapefruit, or 1 cup juice, 1 small cantaloupe, 2 cups fresh berries, 1 slice watermelon (2 inches), 7 apricots, 1 large peach, 1 slice canned (sweetened) pineapple, 1 cup pineapple juice, 6 plums, 1 apple, 1 medium bunch grapes (1/2 pound), 6 nectarines, 1 pear, 30 cherries, 1 banana, 5 prunes, or 1/2 cup cooked (without sugar) dried fruit.

Use as desired: Clear soup, or plain tea or coffee.

Measure all servings: Do not overeat: Avoid concentrated foods such as candy, honey, jam, syrup, and sugar.

Constipation: Clinical and Roentgenologic Evaluation of the Use of Bran

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CHICAGO, ILLINOIS

For many years bran has been used as a laxative, apparently with some encouraging results and has become generally accepted as a preventive dietary agent in constipation. The literature, however, bears very little evidence to place this contention on a scientific basis.

In 1940, Fantus, Kopstein and Schmidt (1) made a systematic study of intestinal motility as influenced by bran; in this work bran was administered to normal individuals and the intestinal motility was determined by roentgenograms. Two distinct observations were made by Fantus and his co-workers; first,
that bran does not accelerate a twenty-four hour cecal emptying time, but that it does accelerate a forty-eight hour cecal emptying time, and secondly, that the total emptying time of the gastro-intestinal tract is influenced only in the normal individuals who had a forty-eight hour or longer cecal emptying time.

The present study is designed to establish the facts about the influence of bran on intestinal evacuation in individuals who are constipated. We selected, therefore, over a considerable period of time, a large number of patients with known delayed bowel function and studied the cases clinically and roentgenologically. In the choice of cases for study we were particularly interested in selecting patients who would demonstrate etiologic factors commonly recognized to produce constipation.

The following types were included in this presentation:

1. Habit (irregularities) .......... 54 patients
2. Diet (indiscretion) ........ 35 " "
3. Spastic (constipation) ..... 6 " "
4. Atonic (constipation) ..... 14 " "
5. Mechanical (causes) ...... 26 " "

METHOD OF STUDY

Throughout this procedure the patients were not permitted any oral medication or enemas. Each individual was observed at regular intervals before and after routine procedure in our clinic.

At the onset a complete gastro-intestinal study was made roentgenologically by administering 60 to 70 grams of barium sulfate as a water suspension; after complete emptying of the initial barium meal, 30 grams of bran was given to the patient daily for one week, then a gastro-intestinal study made roentgenologically as a second series. While the X-ray studies were made the daily administration of bran was continued. Then the bran was discontinued for one week and the roentgenological study repeated for the third time. In our discussion of the three series of roentgenologic study we refer to cecal emptying time and total emptying time as to results obtained "before," "during," and "after" administration of bran.

RESULTS

A. Clinical:

In this group we studied a total of 135 patients, fifty-three males and eighty-two females. These were classified into Group I, comprising 53 male patients and Group II of 82 female patients.

For purposes of discussion we subdivided each of the above groups into class A, to indicate which patients were clinically improved, class B to show which remained unchanged and class C to indicate which patients became worse after bran intake.

In the following table we tabulate the clinical results obtained in each of the groups described:

<table>
<thead>
<tr>
<th>Groups</th>
<th>No. of Patients Observed</th>
<th>Sex</th>
<th>Clinical Progress by Classes No. of Patients in Each</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>53</td>
<td>Male</td>
<td>A</td>
</tr>
<tr>
<td>II</td>
<td>82</td>
<td>Female</td>
<td>64</td>
</tr>
<tr>
<td>Total</td>
<td>135</td>
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<td>107</td>
</tr>
</tbody>
</table>

The results of clinical observations recorded in Table I are subjective findings given to us by the patient. The patients were instructed to record progress made as to daily bowel evacuations before, during and after bran intake and we were obliged to accept their records as authentic. In order therefore to be in a position to evaluate the accuracy of such findings these patients were studied by roentgenograms before, during and after intake of bran so that a correlation was possible.

B. Roentgenologic:

In recording the findings of roentgenologic studies it is essential to consider the total emptying time and the cecal emptying time of the gastro-intestinal tract. According to Kopstein (2) a seventy-two hour emptying time of the cecum is considered as delayed motility and a ninety-six hour total emptying time is accepted as a delay in the gastro-intestinal tract.

The results recorded in the Table II show the number of patients studied by roentgenograms which demonstrates delayed cecal and total emptying time while on bran.

<table>
<thead>
<tr>
<th>Groups</th>
<th>No. of Patients Observed</th>
<th>Sex</th>
<th>No. of Patients Showing Delayed Motility</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>53</td>
<td>Male</td>
<td>7</td>
</tr>
<tr>
<td>II</td>
<td>82</td>
<td>Female</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>135</td>
<td></td>
<td>16</td>
</tr>
</tbody>
</table>

Another item that became of interest is the question of improvement in bowel activity with the aid of bran as compared with bowel activity recorded before bran intake and after bran was discontinued. The following table shows the above comparison in 135 patients studied roentgenologically.

<table>
<thead>
<tr>
<th>Groups</th>
<th>No. of Patients Observed</th>
<th>Sex</th>
<th>No. of Patients with Delayed Cecal Emptying Time</th>
<th>No. of Patients with Delayed Total Emptying Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>53</td>
<td>Male</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>II</td>
<td>82</td>
<td>Female</td>
<td>19</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>135</td>
<td></td>
<td>31</td>
<td>24</td>
</tr>
</tbody>
</table>