

THE EFFECTS OF NUTRITION EDUCATION
ON VEGETABLE ACCEPTANCE OF
PRESCHOOL CHILDREN

A THESIS

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We hereby recommend that the Thesis prepared under
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be accepted as fulfilling this part of the requirements for the Degree of
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I. INTRODUCTION

According to the United States Department of Agriculture (USDA) the amount of vegetables consumed is declining in the United States (1). In addition, further research has shown that among preschool children, vegetables are the least liked food (2). Therefore, it is important to expand the young child's knowledge of vegetables during the formative years. Most children like to experiment at this age, and the bright colors and different textures of vegetables should aid in their acceptance by the child. Lowenberg, on the basis of extensive observations of the reaction of children to food, suggested that their acceptance of food was related to the color, flavor, texture, and temperature of the food as well as the size of servings and the attitude and atmosphere in which it was presented (3). Other variables influencing the dietary choices of a preschooler were: sex, ordinal position in the family, the mother's employment status, education, and nutrition education (4). Food preferences of children also appeared to be related to those of other family members, especially the father whose food likes influenced the frequency with which specific foods were served. If at an early age children are encouraged to try new foods, especially different vegetables, this be-

havior will enable them to develop a wide range of vegetable acceptance.

Children could be encouraged to consume fruits and vegetables through participation in preschool nutrition education programs. Food consumption affects mental development, muscular mastery of the body, social and emotional development, and physical growth. The school where other basic learnings occur seems the logical place for nutrition education. The younger the child, the easier his eating habits are to improve. Classroom teachers have a strong influence on the attitudes and habits of children; therefore, they are the persons best suited to teach nutrition education. A preschool unit designed to help children learn to like and enjoy vegetables that could easily be taught by preschool teachers should be considered by all nursery schools as a part of their curriculum. The effectiveness of such nutrition units has been shown and reported in the literature. The authors of these studies have noted the need for further development of teaching guides for the preschool child and the need for further testing to determine the most effective teaching methods available. Such a unit was developed by the investigator to aid in introducing a vegetable unit geared to the preschool level. A panel of three experts with backgrounds in the fields of

nutrition, curriculum development, and early childhood education have examined the unit for validity.

The unit's purpose was to show how nutrition fits naturally into the nursery school program. Planned classroom activities are described which should help children to develop improved vegetable acceptance (See appendix A). The unit was presented to preschoolers at Westgate Nursery School in Beaumont, Texas. By presenting the unit to this sample group the investigator attempted to further validate the vegetable unit as beneficial in changing the children's eating behavior through the use of pretest/posttest data.

II. STATEMENT OF THE PROBLEM

The purpose of this study was to determine the validity of a nutrition education unit emphasizing raw vegetables as acceptable snack food choices by preschool children. A measure of the effectiveness of the nutrition education unit was made by comparing test results of a group of children receiving the education unit with a group of children receiving no nutritional instruction. To test these assumptions, the following questions were investigated: Is there a significant difference between the snack choices of preschool children who receive the nutrition education unit as compared to the snack choices of a similar group of children who receive no instruction? Is there a significant difference in pretest and posttest scores of the student's ability to recognize different vegetables?

III. REVIEW OF LITERATURE

Several studies to determine food preferences of children which represent their reaction to the taste, texture, and temperature of food have all led to similar conclusions. Only thirty-seven percent to forty-one percent of the children studied liked vegetables (5). These low percentages indicate the need for early nutrition education. Several similar studies have been conducted to encourage children at an early age to consume vegetables through participation in preschool nutrition education programs.

The first study was directed by a Texas Woman's University graduate student, Nancy Jane Sewell, in 1975. The purpose of Sewell's study was to determine the effects of a nutrition education unit upon the acceptance of green and yellow vegetables by preschool children. The experimental group consisted of nineteen children and the control group was composed of thirty children enrolled in nursery and day care centers. An educational unit taught to the children of the experimental group for a period of four weeks focused on six vegetables. Overall vegetable preference scores were computed for each child and his parents. An analysis of covariance was used to analyze the difference in pretest and posttest scores for vegetable

acceptance. For every vegetable, except carrots in the raw form, posttest scores for the experimental group were significantly higher than the comparative scores for the control group. Differences between age groups were nonsignificant. Significant relationships were found between the vegetable preference scores of the family members and children. A positive but weak relationship was found between the frequency with which the child was allowed to select the vegetables served in the home and the child's overall vegetable preference score (6).

Another recent study was directed by a Washington State University graduate student, Susan Jeanne Schewnmann, in 1975. The purpose of this study was to determine the acceptance of vegetables by preschool children following participation in vegetable-oriented activities and to determine the effect of the educational activity on the consumption of vegetables in the home. A questionnaire and a game were used to assess the children's vegetable preference. Sixteen children served as the subjects. The results indicated that following the educational program a definite gain was noted in acceptance of each test vegetable: asparagus, broccoli, turnips, rutabaga, and spinach. Turnips were found to be the most accepted vegetable and asparagus the least. Statistical analysis revealed the vegetable exposure following an educational program and the

children's acceptance two months after the program were significant for turnips, asparagus, rutabaga, and spinach, but not for broccoli. The carryover to the home after the educational unit was apparent as all test vegetables increased in acceptance. The response given by the mothers and subjects differed in their assessment of the subject's preference for vegetables. For the most part the mother's estimate of her child's acceptance tended to be higher than that indicated by her child (7).

Another similar study was conducted in 1969 by Alford and Tibbets. The purpose of this study was to evaluate the effectiveness of a nutrition education program concerned with vegetables in a group feeding situation. A camp for diabetic children was the setting. In the first camp session, seventy-one children serving as the experimental group were observed for vegetable eating practices and given an educational program on vegetables. The children's vegetable consumption was recorded. During the second camp session, eighty-nine children serving as the control group were not given the educational program and their vegetable consumption was recorded. Vegetable consumption increased significantly in the experimental group and did not in the control group. The authors concluded that for these children, education was an important

factor in the vegetable consumption practices (8).

These studies indicate that nursery school and group experiences offer a good environment for developing nutrition habits. McWilliams states that three basic attitudes underlying the philosophy of a nursery school provide the key to building these habits. She states:

1. The attitude of continuous curiosity and exploration encourages children to learn by feeling and tasting a wide variety of foods.
2. The attitude that a child's way of doing things is acceptable makes it easy for a child to thoroughly examine and then to enjoy his food.
3. The attitude of expectancy in the school urges a child to develop confidence that he can do many things including eating his lunch and trying new foods (2).

Often it is easier to introduce new foods in the nursery school setting than at the child's home because he not only sees adults enjoying food, but he has an example set by his nursery school peers.

Studies have shown that a nutrition education program fits naturally into the nursery school classroom. Classroom teachers have a strong influence on the attitudes and habits of children; therefore, they should be well suited to teach nutrition education. Greater vegetable acceptance should be an important goal in child feeding. A nutrition education unit in which the child has positive reinforcement,

and the active participation of both parents should aid in increasing the preschool child's food choices.

IV. HYPOTHESES

As a result of a review of the literature several hypotheses can be made. The research hypotheses of this study were: There will be a significant difference between the snack choices of the experimental group of children who receive the nutrition education unit as compared to the snack choices of a similar group of children who receive no nutrition instruction, and there will be a significant difference in the scores on a pretest/posttest in the student's ability to recognize different vegetables. The null hypotheses tested were: There will be no significant differences between the snack choices of the experimental group of children who receive the nutrition education unit as compared to the snack choices of a similar group of children who receive no nutrition instruction, and there will be no significant difference in the pretest/posttest scores of the student's ability to recognize different vegetables. The independent variable will be the nutrition education unit, and the dependent variables will be the choice of nutritious snacks versus non-nutritious snacks and test scores of vegetable recognition. The minimum acceptable level of probability for testing the null hypotheses in this study will be $p < .05$.

V. METHODS AND PROCEDURES

Description of Education Unit

The effects of a nutrition education unit emphasizing vegetables as acceptable snack food choices by preschool children was used. A similar unit developed by the investigator was pilot tested in April 1978 on a sample group similar to the one used in this study. The 1978 study indicated a significant increase in the acceptance of the test vegetables after the nutrition unit was presented. For the current study, a six part education unit has been developed to aid in introducing a vegetable unit geared to the preschool level (see appendix A). A panel of three experts with backgrounds in the fields of nutrition, curriculum development, and early childhood education have examined the unit for validity. The unit's purpose was to show how nutrition education fits naturally into the nursery school program. Planned classroom activities should have helped children to develop improved vegetable acceptance.

These activities included the introduction of the Basic Four Food groups through the use of a colorful flip chart, the story of "The Good Health Train", and a coloring book published by the USDA entitled, "The Thing The Professor Forgot" (see appendix A). Vegetables were emphasized as a

nutritious healthful part of our daily diet. Vegetable model pictures were introduced to help the children identify and recognize each vegetable. In addition, the senses of smell, feel, and taste were utilized through the use of a blindfold, a "feel bag", and tasting the four test vegetables. Sources of vegetables, farms, grocery stores, vegetable stands, etc. were emphasized through story-telling ("Story of Kenny Cabbage"), role playing, and an actual field trip. Other activities in which the children participated included making collage placemats from vegetable pictures cut from magazines, shopping in a pretend grocery store, viewing the film and book, "The Story of Stone Soup," and helping prepare the vegetables for Stone Soup.

The overall objectives of the teaching unit were to influence the children's snack eating behavior, to motivate a liking of new vegetables, and to teach children to recognize different vegetables. Behavioral objectives were: The child should be able to: (1) Choose nutritious vegetable snacks, (2) Recognize different vegetables, (3) Readily taste new foods, and (4) Help in vegetable preparation.

Description of Sample

The nutrition education unit was presented to a pre-school group of children at Westgate Nursery School, a church sponsored nursery school, in Beaumont, Texas. Twenty-eight

children ranging in age from four to five years were involved in this study. Fifteen children served as the experimental group and participated in the education unit. A comparison group of thirteen children served as the control group. All the children received a pretest and posttest to determine their snack choices before and after the education unit was presented to the experimental group and to determine the number of vegetables recognized before and after the unit. The children chose four snack items from a group of eight snack foods. Four snack items representing undesirable foods included a cookie, candy, chips, and a cupcake. The other four snacks included four raw vegetables, cucumbers, yellow squash, carrots, and cauliflower, to be served with a dip. The reason the vegetables were served raw was to avoid differing appearances due to cooking variations. All foods were served on identical white plates to avoid prejudice of color. In addition, the children were asked to point out a particular vegetable from a group of ten pictures to test his recognition level before and after the education unit. All children were tested in alphabetical order by class to avoid showing favoritism. The investigator read prepared instructions from a sheet of paper to each student privately, and the children had an opportunity to ask questions. The students were not rewarded by praise for a correct response nor were they criticized for an incorrect answer. Reinforce-

ment by eye contact was avoided by the investigator as much as possible. Sex and age group differences of the children were noted.

Testing Method and Analysis

The snacks were rated according to the following method: "0" for an undesirable food, and "1" for a desirable vegetable. The investigator completed the rating through observation. The score of each child was then totaled and ranged from 0-4, four being the optimum score. The data were considered to be interval. Analysis of variance was used to evaluate the data from each measure to determine the significance of the results of the experiment the data were normally distributed and met the assumptions of the analysis of variance.

Validation of Testing Method

A panel of two experts with backgrounds in research and program evaluation reviewed the testing procedures of this study to determine their validity in measuring the objectives (see appendix C). The two tests were found to be appropriate to the age of the children. The test characteristics of objectivity, reliability, and validity were evaluated. The experts concluded the tests appeared to be adequately objective and appeared to measure what was in-

cluded in the teaching module. They concluded that reliability could not be evaluated. The relativity of the scoring system was judged to be adequate. The panel made suggestions and general comments including the statements, "Add more finger foods, calculate reliability from pretest data, and good study."

VI. RESULTS, CONCLUSIONS, AND IMPLICATIONS FOR RESEARCH

Results and Discussion

In order to interpret the data collected in this study several factors must be considered. The first is the sample size, only twenty-eight children were investigated, and the data must be regarded as only an indication of a trend. In addition, many variables could not be controlled by the investigator because human subjects were involved. Other factors such as the atmosphere of the nursery school and home and attitudes of the family regarding vegetable acceptance may have affected the data collected.

Subjects Participation

The nutrition education unit was presented to a pre-school group of children at Westgate Nursery School in Beaumont, Texas. A total of twenty-eight students ranging in age from four to five years participated in the study. Fifteen children serving as the experimental group took part in the education unit. A comparison group of thirteen children served as the control group. The mean age of the experimental group of children was 64.7 months. The mean age of the control group of children was 53.7 months. Sex and age of both groups of children are listed in table 1 and table 2. The children came from varied economic backgrounds and from families with one child and families with several children.

The students received a pretest/posttest to determine their snack choices before and after the education unit was presented to the experimental group and to determine the number of vegetables recognized before and after the unit.

TABLE 1

Age and Sex of Control Group of Nursery School
Children Receiving Nutrition Education Unit

AGE (in months)	SEX	
	Male	Female
N = 13		
48	1	1
50	1	
52	2	
57		1
60	1	1
61	2	
62	1	
63	2	

Mean age = 53.7 months

TABLE 2

Age and Sex of Experimental Group of Nursery School
Children Receiving Nutrition Education Unit

AGE (in months)	SEX	
	Male	Female
N = 15		
55		1
61	1	
62		2
63		1
65	2	1
66	1	
67	2	
68	2	2

Mean age = 64.7 months

Statistical Analysis of Snack Choices

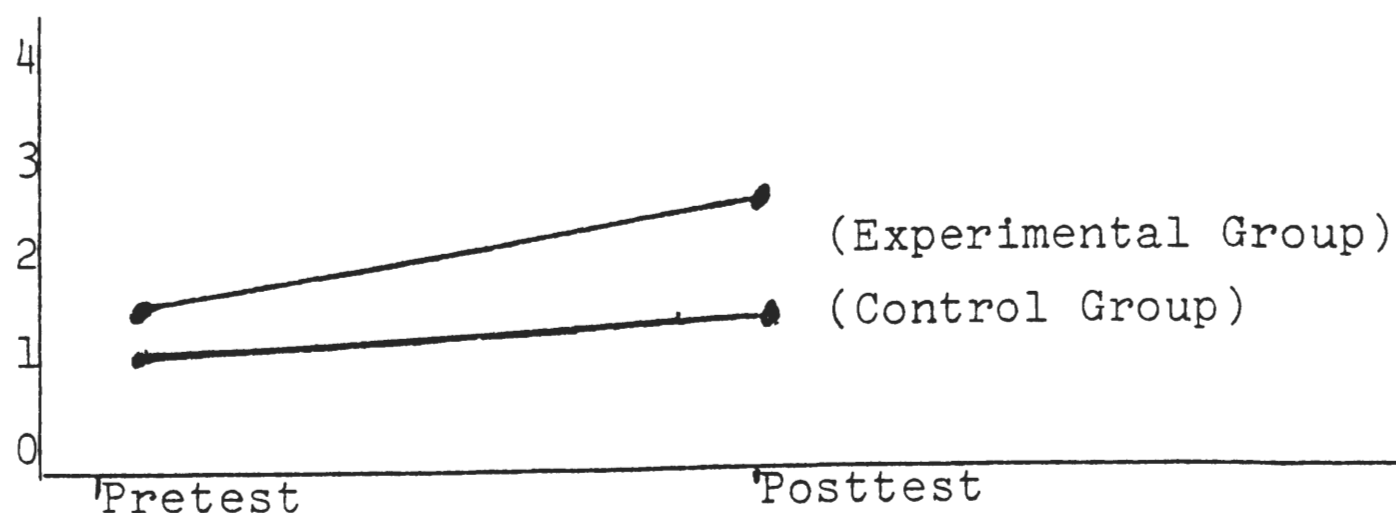
The two dependent variables, the choice of nutritious versus non-nutritious snacks and test scores of vegetable recognition were analyzed separately. Analysis of variance was used to evaluate the data from each measure to determine the significance of the results of the experiment. The snack choices of the experimental group improved significantly ($p < .05$) after the educational unit when compared to the

control group. Because of the results of this study, the researcher rejected the null hypothesis which stated that there will be no significant difference between the snack choices of the experimental group of children who receive the nutrition education unit as compared to the snack choices of a similar group of children who receive no nutrition instruction. Table 3 and figure 1 present the results of this testing procedure (see appendix D).

TABLE 3

Means of Snack Choices by Group and Trial		
Group	Pretest	Posttest
Control	1.1533	1.4615
Experimental	1.4667	2.5333
$F = 4.806, p < .05, df 1/26$		

Fig. 1. Interaction Graph of Means of Snack Choices



Frequency of vegetables chosen by both groups was analyzed for significance using a chi-square statistic. The choice of cucumber by the control group had the greatest increase (from one to four) on the pretest/posttest, while carrots decreased (from seven to five). The choice of cauliflower by the experimental group had the greatest increase (from three to six) while cucumber decreased (from twelve to eleven). Carrots showed no change for the experimental group. The frequency chosen by both groups showed no significant ($p > .05$) pretest/posttest increase. Table 4 indicates the frequency of test vegetables chosen by the control group and the experimental group.

TABLE 4

Frequency of Vegetables Chosen by Both Groups							
Vegetables	Control Group			P	Experimental Group		
	Pretest	Posttest			Pretest	Posttest	P
Carrots	7	5	NS		9	9	NS
Squash	5	6	NS		4	6	NS
Cauliflower	2	3	NS		3	6	NS
Cucumbers	1	4	NS		12	11	NS

NS $p > .05$

There was no significant effect of sex on snack choices in this experiment (see appendix E). The Spearman rank-

order correlation coefficient was used to analyze the effect of age on snack choices of both groups of children. Age apparently had no significant relationship on the snack choices of the children as indicated in table 5.

TABLE 5

Effect of Age on Snack Choices of Nursery School Children

Variable 1- Age

Variable 2- Snack Choices

Coefficient	P	N
.2802	.07	28

Statistical Analysis of Vegetable Recognition

Analysis of variance was also used to evaluate the data from pretest and posttest scores of vegetable recognition. The recognition level of the experimental group improved but was not significant when compared to the control group. Therefore, the researcher failed to reject the null hypothesis which stated that there will be no significant difference in the pretest/posttest scores of the student's ability to recognize different vegetables. Failure of the experimental group to reach a significant recognition level might be attributed to the fact that several

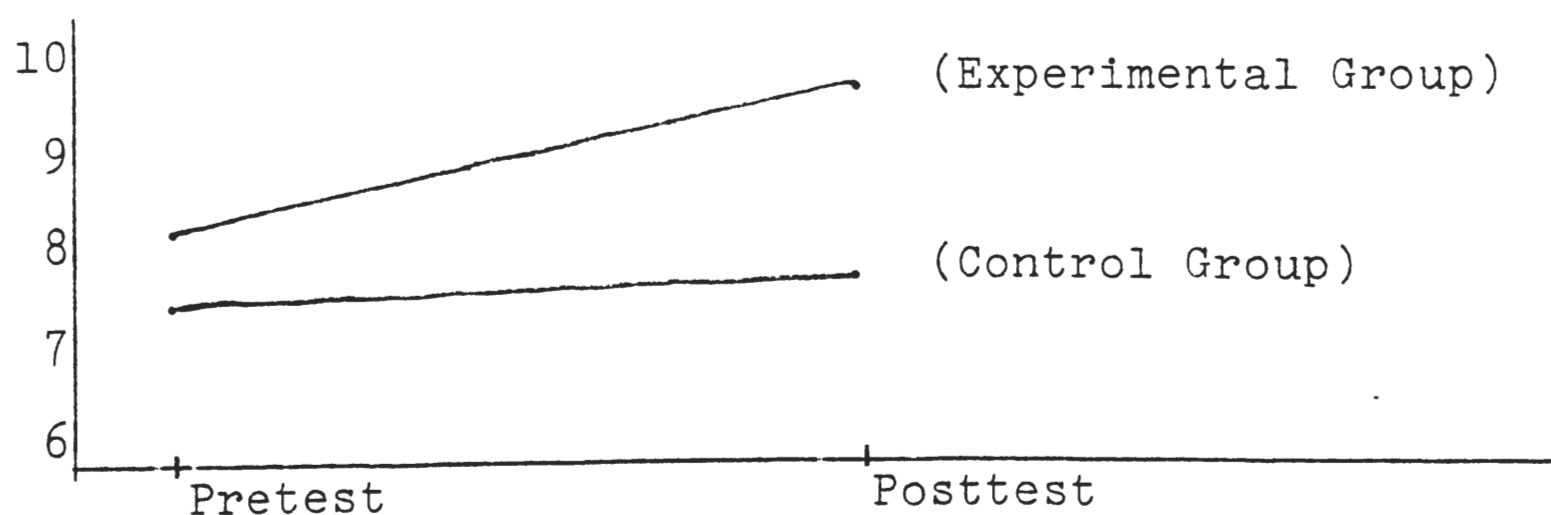
students of the experimental group scored a perfect ten on the pretest for vegetable recognition which left no room for improvement on the posttest. Non-randomness of the sample and the small number of children tested also may have attributed to the failure to receive significant results for vegetable recognition. Table 6 and figure 2 present the results of this testing procedure (see appendix F).

TABLE 6

Results of Vegetable Recognition by Group and Trial		
Group	Pretest	Posttest
Control	7.3077	7.5385
Experimental	8.3333	9.7333

$F = 3.999, p = .0533, df 1/26$

Fig. 2. Interaction Graph of Means of Vegetable Recognition



Vegetables are not recognized by the groups before and after the education unit were noted by the investigator. These results indicate the experimental group had a more improved vegetable recognition level on the posttest when compared to that of the control group. Seven vegetables, green beans, asparagus, cauliflower, green peas, tomato, carrots, and corn were recognized by all children of the experimental group on the posttest while only one vegetable, corn, was recognized by all children of the control group on the posttest. Only one member of the experimental group was unable to recognize celery, lettuce, and broccoli. Of the control group, nine members were unable to recognize celery, six failed to recognize lettuce, and three did not recognize broccoli. These results are presented in table 7.

Sex apparently had an effect on the level of vegetable recognition (see appendix G). Males showed no significant change in vegetable recognition, however, females improved. Females tended to do better overall than males. The Spearman rank-order correlation coefficient was used to analyze the effect of age on the vegetable recognition level of both groups of children. Age had a significant relationship on the recognition level of the children as indicated by table 8. The older the child, the higher his recognition level apparently becomes.

TABLE 7

<u>Vegetables Not Recognized by Both Groups</u>				
Vegetables	<u>Control Group</u>		<u>Experimental Group</u>	
	Pretest	Posttest	Pretest	Posttest
Green Beans	2	2	2	0
Celery	6	9	4	1
Asparagus	10	3	6	0
Cauliflower	6	5	6	0
Lettuce	4	6	2	1
Broccoli	3	3	5	1
Green Peas	3	3	1	0
Tomato	2	2	2	0
Carrots	0	2	0	0
Corn	0	0	0	0

TABLE 8

Effect of Age on Vegetable Recognition of Nursery School Children

Variable 1- Age

Variable 2- Recognition Level

Coefficient	P	N
.4424	.01	28

Studies such as the ones by Sewell (6), Schwenemann (7), and Alford (8) have all indicated the success of chang-

ing children's eating habits through preschool nutrition education. The pretest/posttest results of this preschool nutrition education unit emphasizing vegetables have also indicated a significant change in children's eating behavior. Snack choices and vegetable recognition of the experimental group improved after the unit. Such an improvement in vegetable acceptance indicates the effectiveness of nutrition education in the nursery school program.

Conclusions

The results of this study indicated that there was a significant ($p < .05$) difference between the snack choices of the experimental group when compared to the control group. The vegetable recognition level of the experimental group improved ($p = .0533$) but was not significant when compared to the control group.

Findings from this study suggest the effectiveness of nutrition education programs at the nursery school level to lay a foundation for nutrition education during the elementary school years. The study also indicates that the four and five year old child is capable of learning nutritional concepts as a result of participation in nutrition education experiences. Also modification of snack choices made by preschool children and increased vegetable recognition can occur as a result of nutrition education.

Recommendation for Future Research

On the basis of this study, several recommendations regarding future studies can be made. First, a younger group of children should be studied to determine the effect of such a nutrition education unit on their snack choices and vegetable recognition. The educational unit should be further tested using a larger sample. The use of different test vegetables and an increased number of vegetables and finger foods for snack choices should be attempted. In addition, a similar study involving another food group from the Basic Four Food groups could be tried. A similar study with more home involvement might be even more effective especially if the active participation of both parents was included in the serving of test vegetables in the home and in reviewing the education material with their child. Another administration of the posttest should be included after a period of time to determine the long term effect of such a nutrition education unit.

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APPENDIX A

PRESCHOOL NUTRITION EDUCATION CURRICULUM
GUIDE WITH EMPHASIS ON
VEGETABLE ACCEPTANCE

This Nutrition Education Guide was developed to aid in introducing a vegetable unit geared to the preschool level. Its purpose is to show how nutrition education fits naturally into the nursery school program. Planned classroom activities are described which should help children to develop improved vegetable acceptance. The unit will be presented to a class of four and five year old children at Westgate Nursery School in Beaumont, Texas. The nursery school is sponsored by the Church of Christ and has as its goal to give each child experiences that will help to develop satisfying relationships with his peers and authority figures. The "total child" is emphasized through encouragement in the areas of emotional, social, intellectual, physical, and creative development.

OVERALL OBJECTIVES

I. To explain the relation of nutrition to health.

Concepts:

- A. Growth and development
- B. Physical fitness
- C. Endurance
- D. Prevention and recovery from disease

E. Teeth, bones, hair, and skin

F. Nutrients in vegetables

II. To influence childrens' eating habits and motivate a liking of new vegetables.

Concepts:

A. Daily needs of green leafy or yellow vegetables

B. Tasting new vegetables

III. To recognize and identify different vegetables.

Concepts:

A. Shape, size, texture, color, smell, and taste of vegetables

B. Vegetable preparation

IV. To identify the sources of vegetables

Concepts:

A. Vegetable gardens

B. Classification of vegetables

C. Buying vegetables

GENERALIZATIONS

1. Vegetables help children grow and be healthy.
2. Vegetables give children bright eyes and clear skin.
3. Children do not have to like new vegetables but can learn to eat them.
4. Tasting new vegetables can be fun.
5. A green leafy or yellow vegetable should be eaten daily.

6. Vegetables are different in shape, color, texture, size, smell, and taste.
7. Vegetables are prepared in different ways.
8. Vegetables are grown on a farm or in a small garden.
9. Vegetables can be roots, leafy, flowers, fruit, or stem.
10. Vegetables are sold at supermarkets and at vegetable stands.

LESSON PLAN - MONDAY

CONCEPTS	LEARNING EXPERIENCES	SOURCES
Good Nutrition	1. Introductions; name tags with Basic Four given out. 2. Describe through use of a colorful flip chart how good nutrition helps us grow and be healthy (pretty eyes, skin, hair) and gives us energy. (cognitive level - knowledge)	2. My files
Food Groups	3. Story of "The Good Health Train." Use colorful shoe boxes as train-cars (dairy, grain, meat, fruit and vegetables). (cognitive level - recognition) Also discuss what they will eat for lunch and what boxcar their food choice would "ride" on. (cognitive level-application)	3. Marbach, Ellen S., Creative Curriculum, Provo, Utah: Brigham Young University Press (1977), p. 199.
Reasons for Eating	4. Coloring Book, "The Thing the Professor Forgot," emphasizes Basic 4 Food Groups. (cognitive level - recognition)	4. US Government Printing Office: 1978--778-480

LESSON PLAN - WEDNESDAY

CONCEPTS	LEARNING EXPERIENCES	SOURCES
Four Food Groups	1. Review Mondays lesson by letting children tell the story of "The Health Train." (cognitive level - interpretation)	
"Glow" Foods	2. Use vegetable model pictures and let children identify each vegetable. (cognitive level - identification)	2. Dairy Council
Types, sizes, textures, colors, smells, and taste of vegetables	3. Introduce four raw vegetables. (cognitive level - name)	
	4. Smell a vegetable through use of a blindfold and try to guess its name. (cognitive level - recognition)	
	5. Feel Bag - feel vegetables and identify. (cognitive level - recognition)	
	6. Taste raw vegetables with a dip. (cognitive level - to taste)	
Preparation of Vegetable	7. Prepare a carrot in several ways (peel it, make circles, sticks, cook it, grate for salad, put in water to grow). (cognitive level - experiment)	7. Project Head Start Nutrition Education for Young Children, Washington, D.C., DHEW Govt. Printing Office, (1969), 0-366-070, p.34.

LESSON PLAN - FRIDAY

CONCEPTS	LEARNING EXPERIENCES	SOURCES
Sources of Vegetables	<ol style="list-style-type: none"> 1. Use colorful posters to describe gardens and farms. (cognitive level - knowledge) 2. Read story, "The Story of Kenny Cabbage." (cognitive level - describe) 3. Let children act out story using straw hat, hoe and packets of vegetable seeds as props. (cognitive level - relate, dramatize) 4. Discuss field trip tomorrow; vegetables we might see, and good manners. (cognitive level - discuss) 	<ol style="list-style-type: none"> 1. My files 2. Frost, Marie, <u>Food and Nutrition: Teaching Pictures Packet</u>, Resource Sheet #10.

LESSON PLAN - MONDAY

CONCEPTS	LEARNING EXPERIENCES	SOURCES
Vegetable Sources	<ol style="list-style-type: none"> Field trip to local vegetable stand or Farmer's Market, or grocery store. Identify vegetables, purchase some, photograph children and vegetables. (cognitive level - recognition, shop) 	

LESSON PLAN -- WEDNESDAY

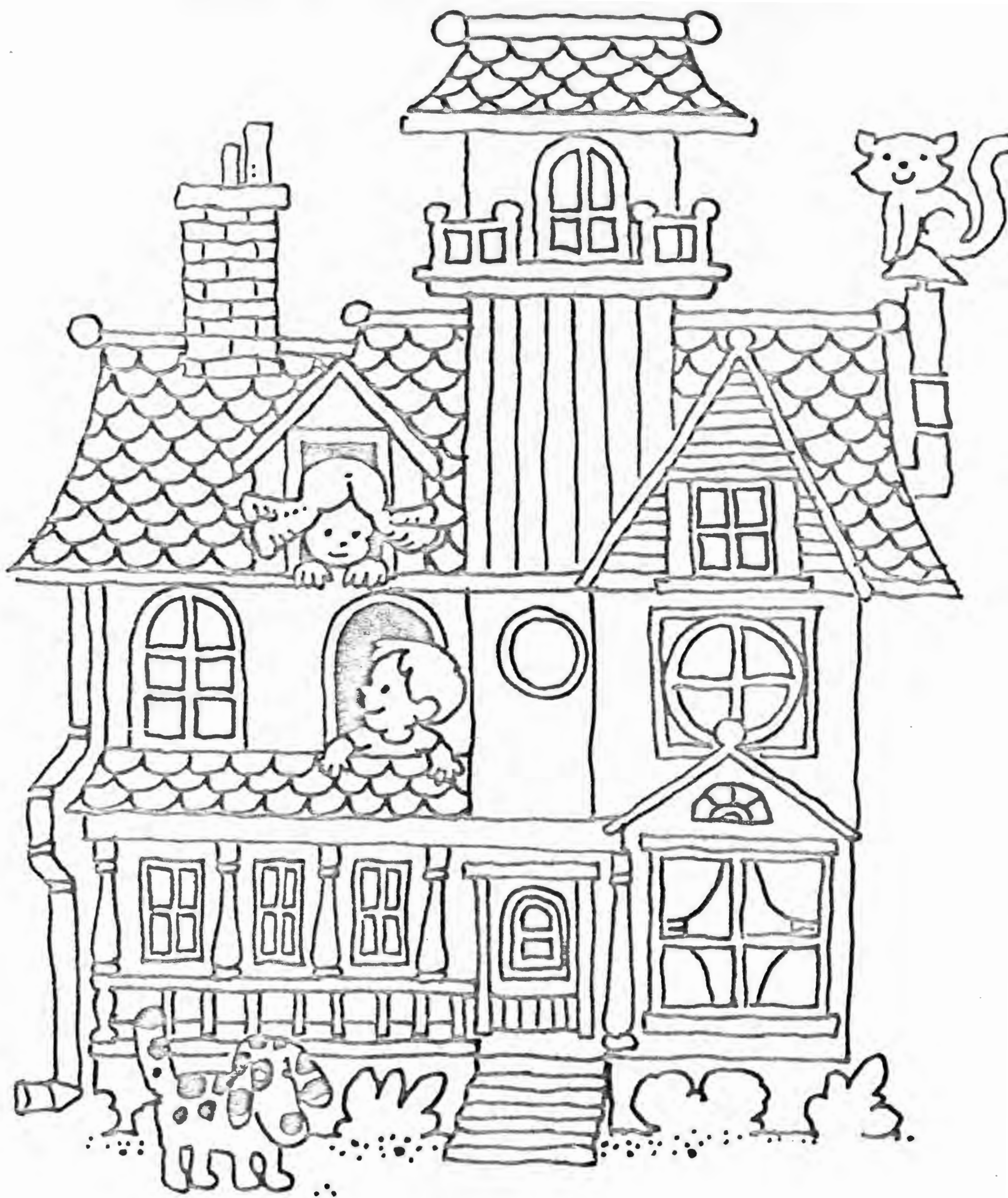
CONCEPTS	LEARNING EXPERIENCES	SOURCES
Sources of Vegetables	<ol style="list-style-type: none">1. Review Field Trip (cognitive level-review)<ol style="list-style-type: none">A. Some may want to tell stories about it. (cognitive level - relate)B. Others may paint, color, or draw pictures of the trip. (cognitive level - express)C. Some may want to glue the photographs to a poster-board and display the pictures. (cognitive level-display)	
Types of Vegetables	<ol style="list-style-type: none">2. Make collage place mats by cutting vegetable pictures from magazines. (cognitive level - locate)	
Sharing Food	<ol style="list-style-type: none">3. View film and book "Stone Soup," ask children to each bring one vegetable for our "Stone Soup" on Friday. (cognitive level - application)	<ol style="list-style-type: none">3. Linguist, Willia, <u>Stone Soup</u>, Western Press, 1970.


LESSON PLAN - FRIDAY

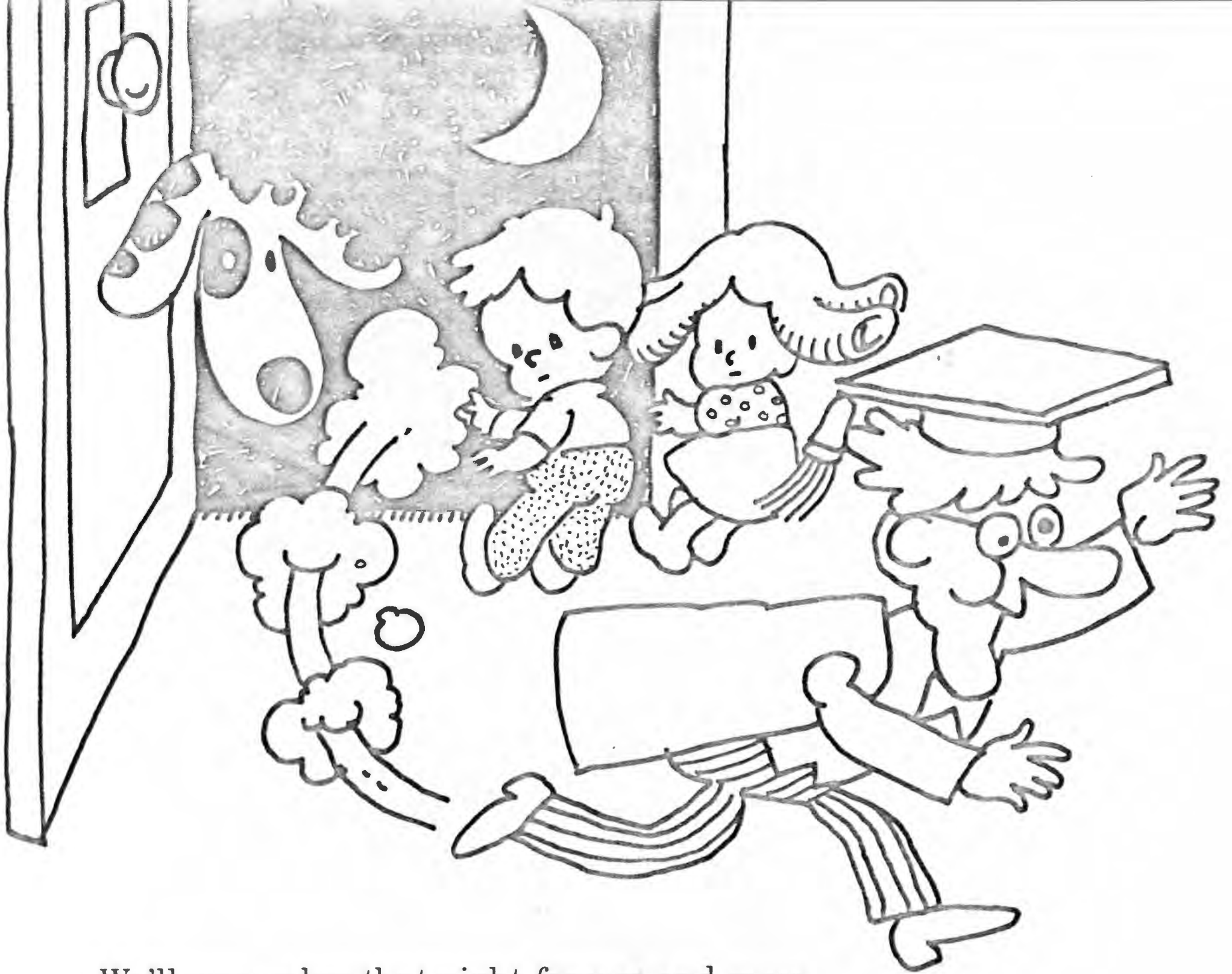
CONCEPTS	LEARNING EXPERIENCES	SOURCES
Sharing Food	<ol style="list-style-type: none"> 1. Review while preparing "Stone Soup." (cognitive level - review and prepare) 2. Play, "Let's Go Shopping." Set up a pretend grocery store with vegetable cans and let each child buy vegetables with pretend money. Use tuff-stuff grocery cart. (cognitive level - shop, dramatize) 	2. Dr. Jane Davidson, Lamar University
Helpers	<ol style="list-style-type: none"> 3. Set table with "collage" placemats and review vegetables on each placemat. (cognitive level - review) <p>CHILDREN CAN:</p> <ol style="list-style-type: none"> A. Wash tables and set B. Pass out napkins C. Pour beverage 	
Socialization	<ol style="list-style-type: none"> 4. Serve soup. (cognitive level - to taste) 5. Review with large flip chart. (cognitive level - review) 	5. My files

THE TALLING THE PROFESSOR & FORGOT





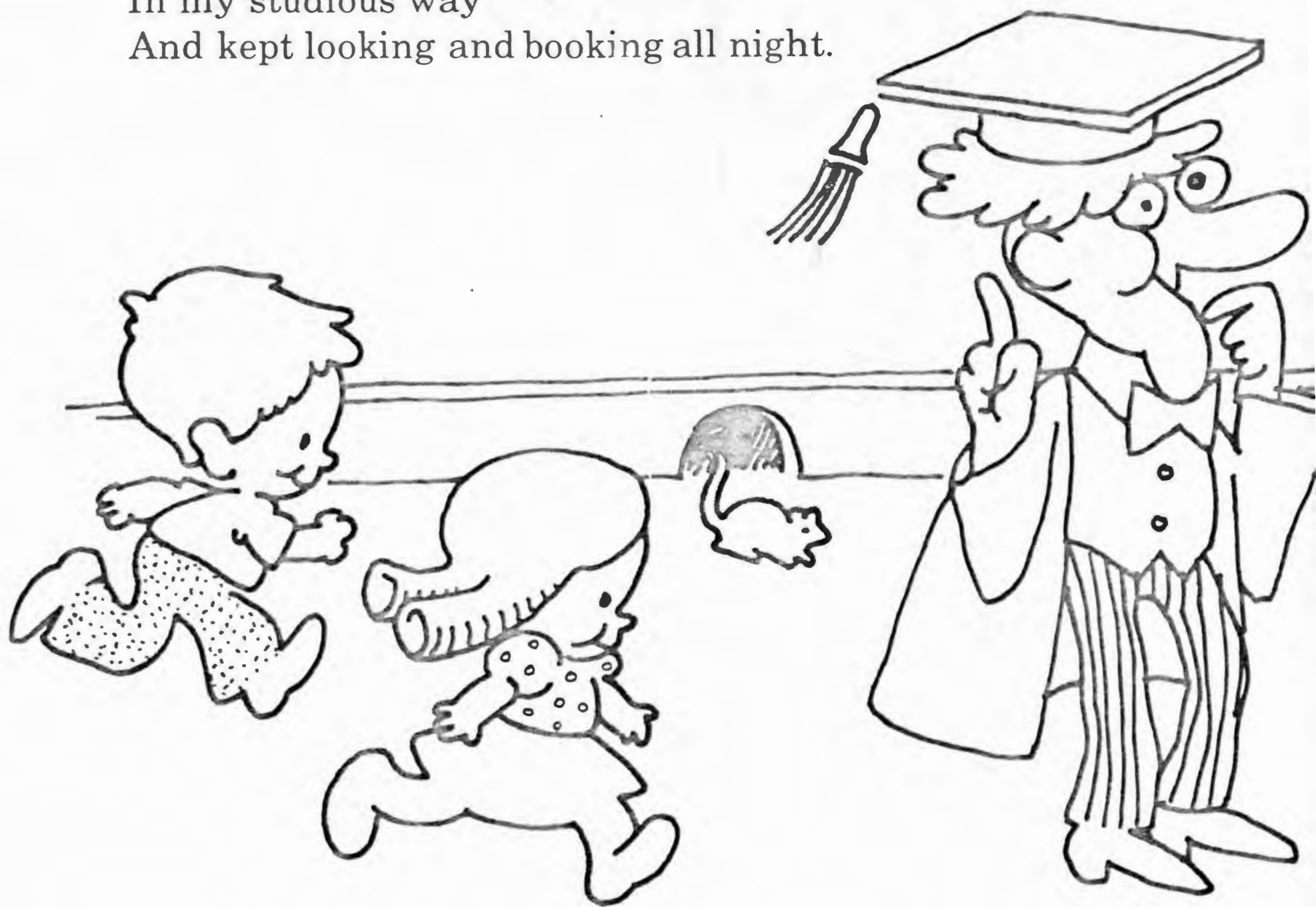
e live in a rickety, four-storied house,
Just we by ourselves, and maybe a mouse—
Or two or three, but no more than that,
Avoiding the glances of Cleo our cat.
And Caesar the dalmatian keeps up the guard
By lurking and leaping out in the yard.



We'll remember that night forever and more,
When a strange sounding noise made us open the door.
And peering all squinty out into the black,
We felt something wisk in, just brushing our back.
Before we could think or could speak or decide,
A tiny professor was standing inside.

"I'm Oonoose Q. Eckwoose,
A professor," said he,—
"I have my degree
In Foodology.
Not biology or psychology.
Not theology or kneeology.
Not chemistry, dentistry, menacery, Christmastree—
I'm a professor of food.
I've simmered and savored
Facts in all flavors
Until I became rather shrewd.

“But in the back of my head
There’s something I’ve read,
And I can’t remember it quite.
I’ve looked in my books
And talked to the cooks.
I’ve studied all day
In my studious way
And kept looking and booking all night.



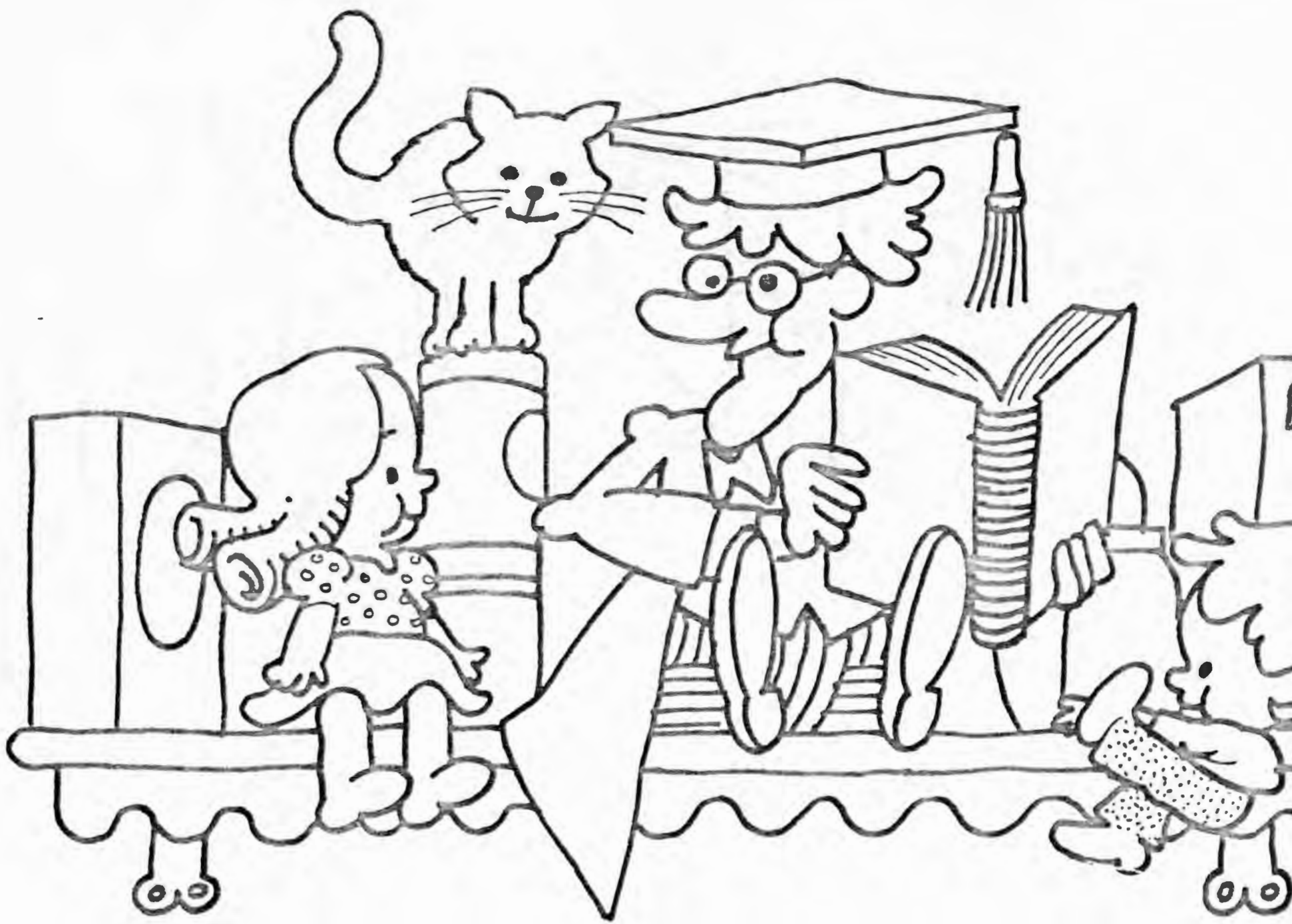
“If I just had a hint
Where I’ve seen it in print,
Though I’ve thought and I’ve thought and I’ve thought.
I’ve done one and all
And I still can’t recall
Where I read what I think I forgot.”

“But Professor—,” we said, and before we were through
He’d motioned for quiet and vanished from view.



We followed, of course, at his rapid pace,
Waking Cleo the cat who joined in the chase.
As we came to the kitchen, there on the floor
Were our pots and our pans and our dishes galore.
Cleo sprang to the cupboard with all four paws speeding.
She climbed to the top where Eckwoose sat reading.





“How clever,” said he,
Tickled with glee,
“How clever I am!
For behind the jam
I found this book that I sought.
It’s what I need
In which to read
The thing that I think I forgot.
So don’t look around,
I’ve no time to come down—
Though I really don’t wish to seem rude.
Please climb up yourself
To this very top shelf,
And I’ll read to you all about food.”

“Ah ha! here’s the fun
On page number one—
A rhyme that you really should know.
If you seriously start
To learn this by heart
You’ll remember it after I go:

“‘If you’re going to be smart, be clever or shrewd,
Be sure to know there are four groups of food.’”



He turned the page while stroking his jaw,
And a beautiful farm was the picture we saw
With a cow and a pig and a hen and her brood.
And beneath it said, "MEAT is the first group of food."
He winked and he blinked as he said, "And you know,
The MEAT GROUP's important, for MEAT helps you grow."

"What if—," we said,
As he turned his head,
"—If we'd eat nothing but MEAT.

Eat burgers and franks
And juicy lamb shanks
And big turkey legs.
The MEAT GROUP has eggs
And peanut butter too.
Yes, that's quite true.
Oh! Such a great tasting treat—
If the MEAT GROUP were all that we'd eat!"

We could tell by the way the professor was staring,
Wrinkling his mouth, his eyes sort of glaring,
That eating the foods from one group at a time
Wasn't exactly what he had in mind.

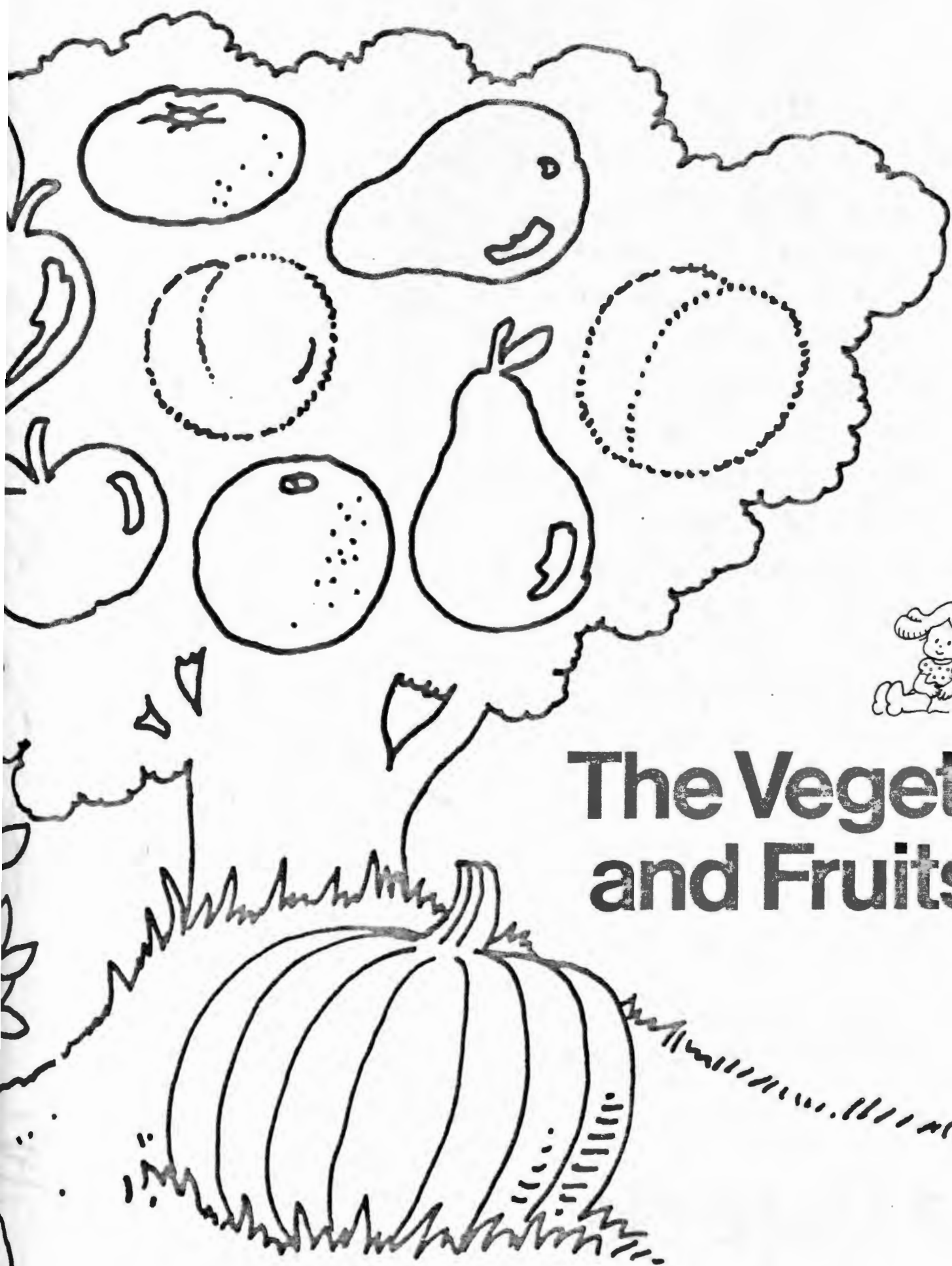
The Meat Group





Next was a garden with lovely things growing.
The farmer was weeding, his wife busy hoeing.
The apples were hanging in trees where they grow.
On the ground were some pumpkins and corn in a row.
And potatoes in soil, growing as roots.
Said he, "Group Two is **VEGETABLES AND FRUITS.**"
He added quite quickly, he sounded so wise:
"They're good for your skin, and good for your eyes."
It all looked so good and so simply delicious!
"What if—" we said loudly, as he grew suspicious.





The Vegetables and Fruits Group

“—If VEGETABLES AND FRUITS were all that we’d eat.
Just carrots and peas
And ‘Pass the fruit, please’.
Great salads and greens
And lots of those beans.
Oh yes! what a fabulous treat
If VEGETABLES AND FRUITS were all that we’d eat!”

Now, on the next page in big print it said:
“The third of the food groups is CEREALS AND BREADS.”
And then Eckwoose added so that we’d know:
“This group gives you energy—gives you get-up-and-go.”
And he showed us a picture of great things to eat,
Of beautiful fields of corn, oats and wheat.
And there in the kitchen inside the house,
Baking fresh bread, was the farmer’s young spouse.
Beside her were good things which all come from grain,
Cereals and sweet rolls and breads, rye and plain.
They all looked so tempting, we couldn’t help ourselves,
“What if—” we said meekly, on that very top shelf,

“—If we’d only eat CEREALS AND BREADS!
Oh just think of the fun
With a fresh hotdog bun
And breads of all sorts
And pastries and tortes
And corn or wheatflakes
And pretzels and cakes!
No, it’s as plain as the hair on your head,
We’ll eat nothing but CEREALS AND BREADS.”



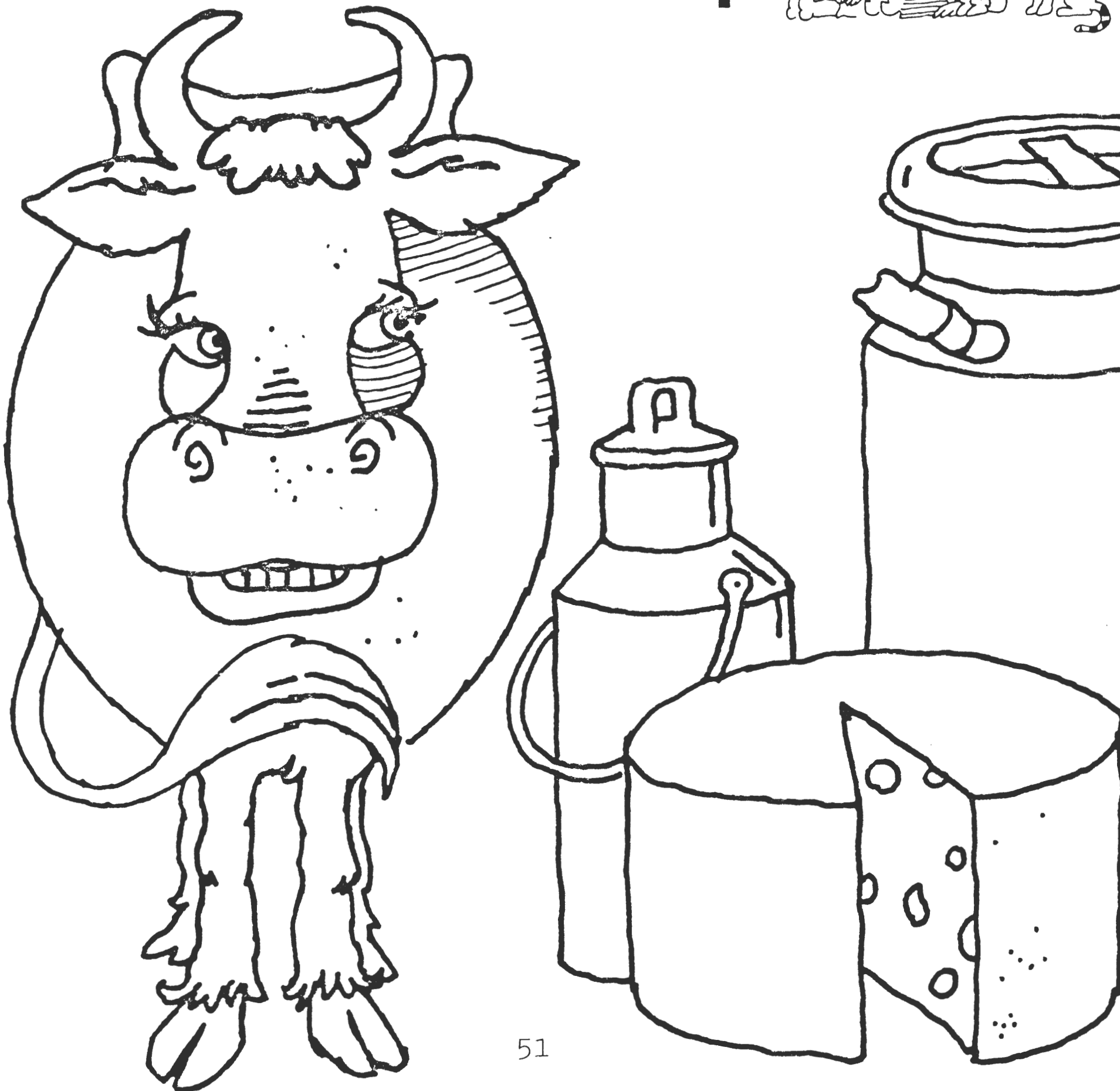
The Cereals and Breads Group

Now we were sure that we’d said something wrong.
We knew it right off—it didn’t take long.
He mumbled. He grumbled. He trembled with rage.
But with a faint little “Humph!” he just turned the page.



And oh, what a picture came into view!
A milkhouse of goodies and a cow outside too.
There were cheeses and fresh milk and ice cream by the scoop
Said he oh-so-proudly, "MILK's the last group."
He read from the fine print down underneath:
"MILK gives you strong bones and fine healthy teeth.'"

The Milk Group



The pictures made us so hungry—they were a beautiful sight.
We could have eaten them all, every last bite.
“What if—” we blurted. But oh, what we’d said!
We saw the professor was turning quite red.

“Halt! Stop! Enough!”

His voice was quite gruff.

“I know what you’re thinking now.

You’d eat only these things from the cow.

I’ve read all the books,

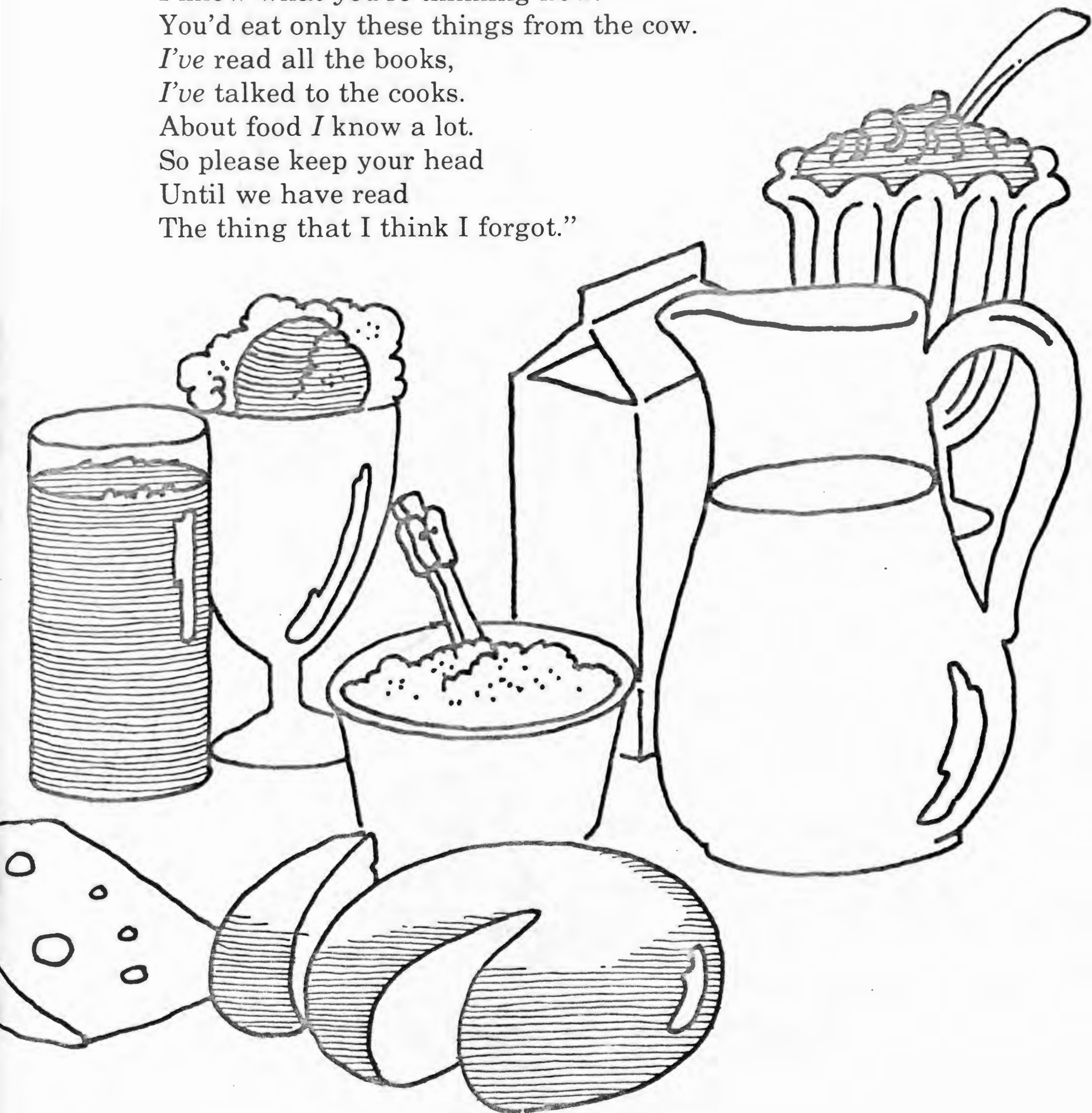
I’ve talked to the cooks.

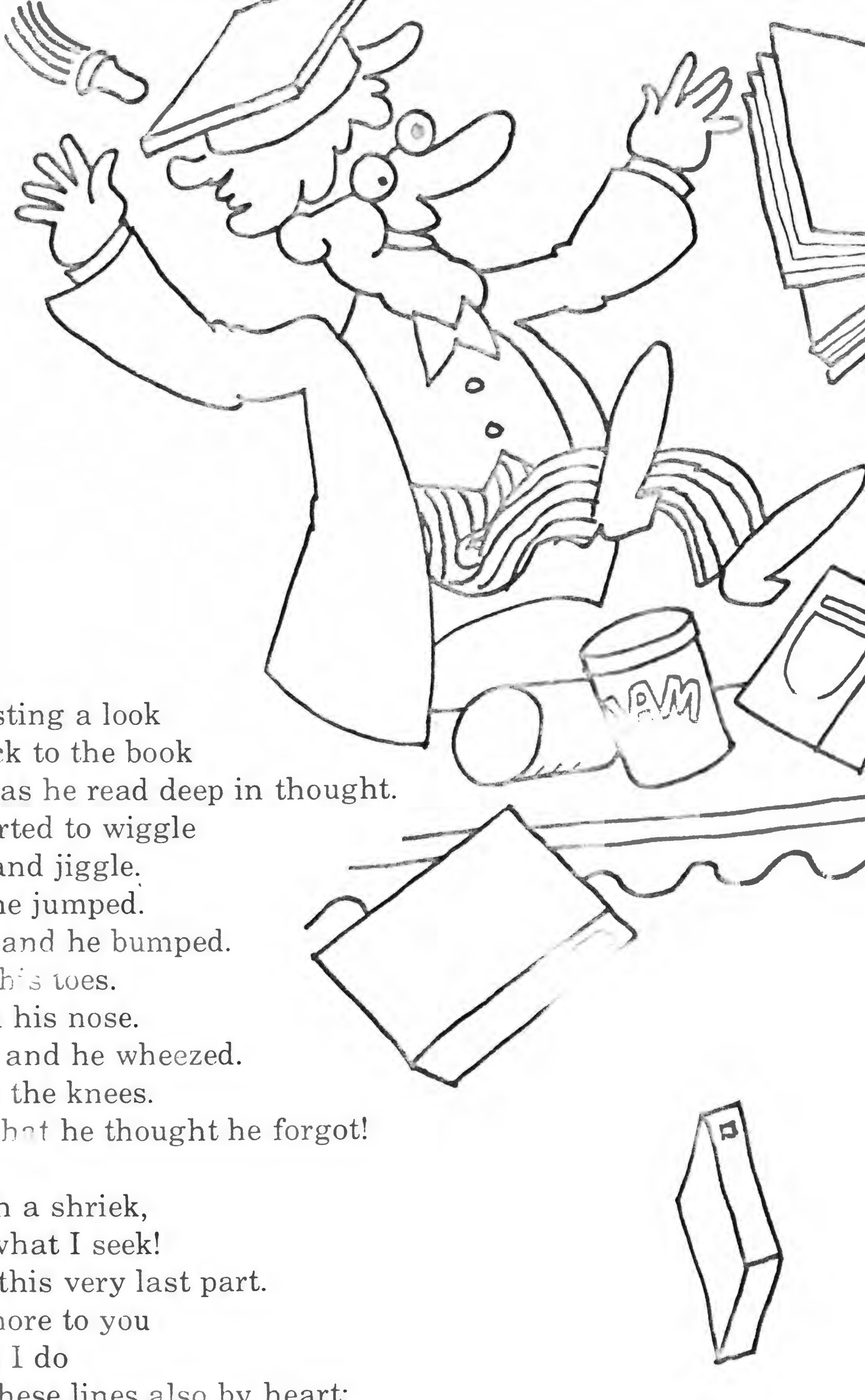
About food *I* know a lot.

So please keep your head

Until we have read

The thing that I think I forgot.”

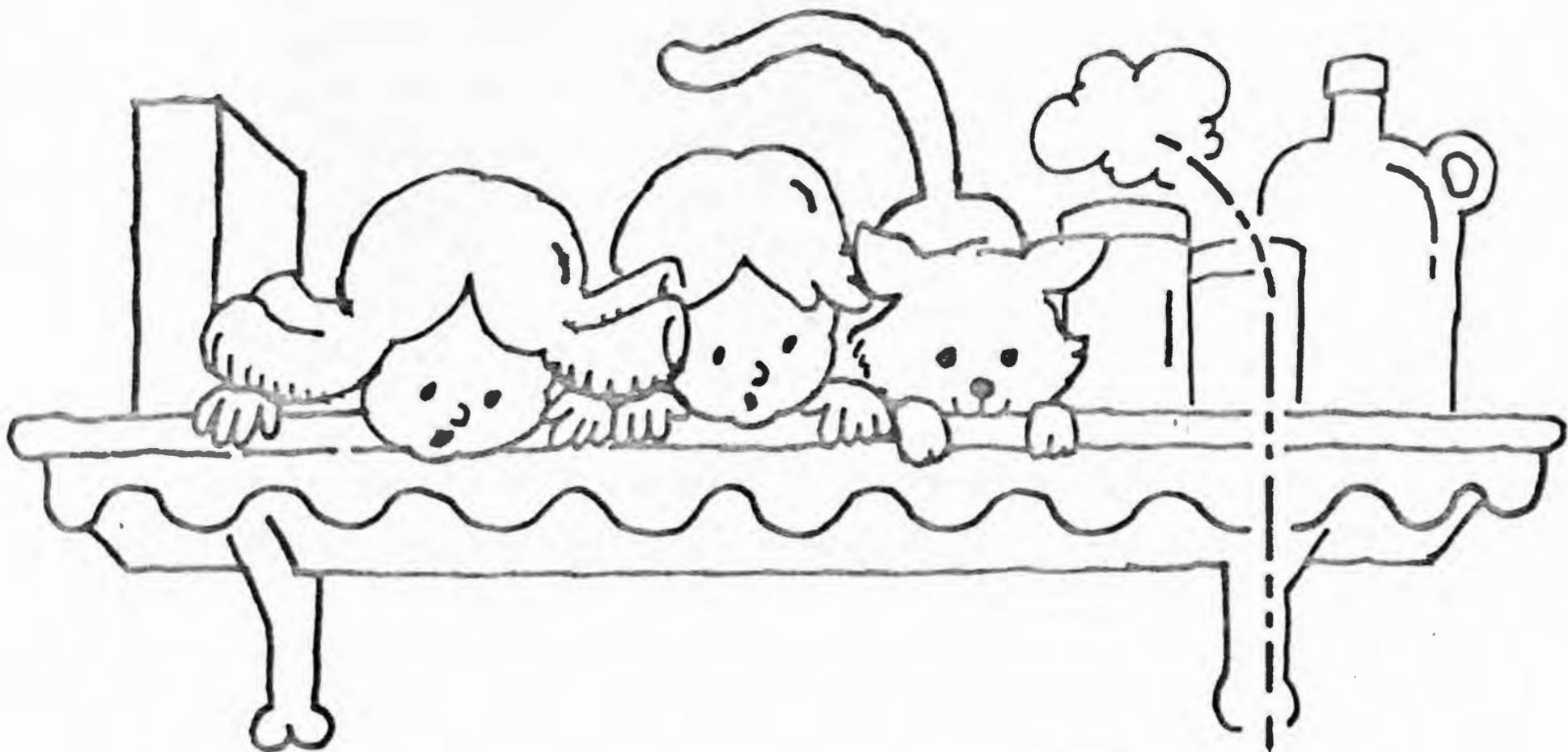




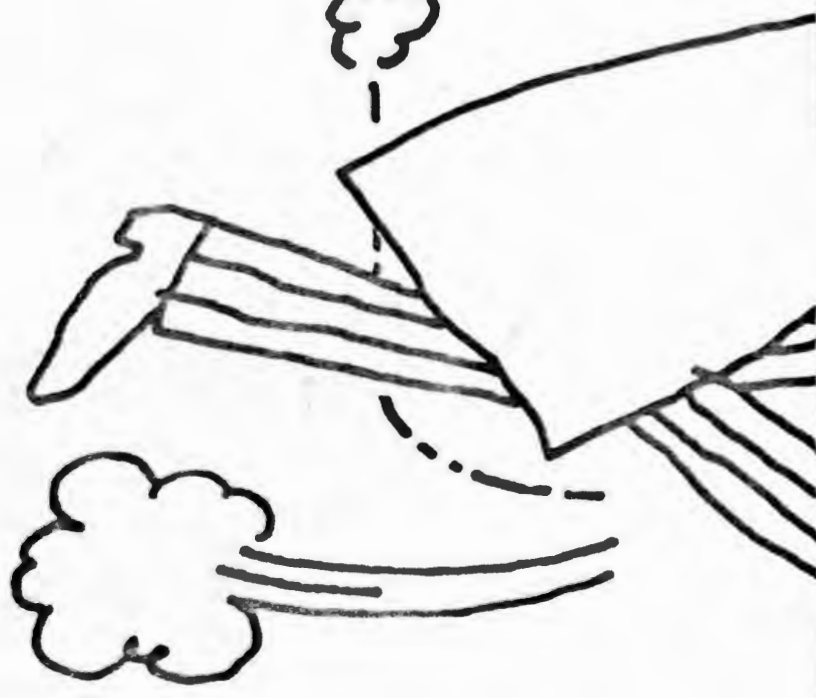
Without wasting a look
He went back to the book
And sighed as he read deep in thought.
Then he started to wiggle
And riggle and jiggle.
He jostled, he jumped.
He humped and he bumped.
He wiggled his toes.
He wrinkled his nose.
He coughed and he wheezed.
He shook in the knees.
He'd read what he thought he forgot!

He said with a shriek,
"I've found what I seek!
It's here in this very last part.
It'll mean more to you
If you do as I do
And learn these lines also by heart:

"To have healthy bodies for work, sleep or play
Eat many good foods from four groups, every day.'"



He slammed the book shut with a gleam in his eye.
With a grin on his face, he straightened his tie.
He giggled, he cackled, so pleased with himself
And true to his form, he jumped down from the shelf.
And was gone so quickly out into the dark
That dear old dog Caesar had no time to bark.

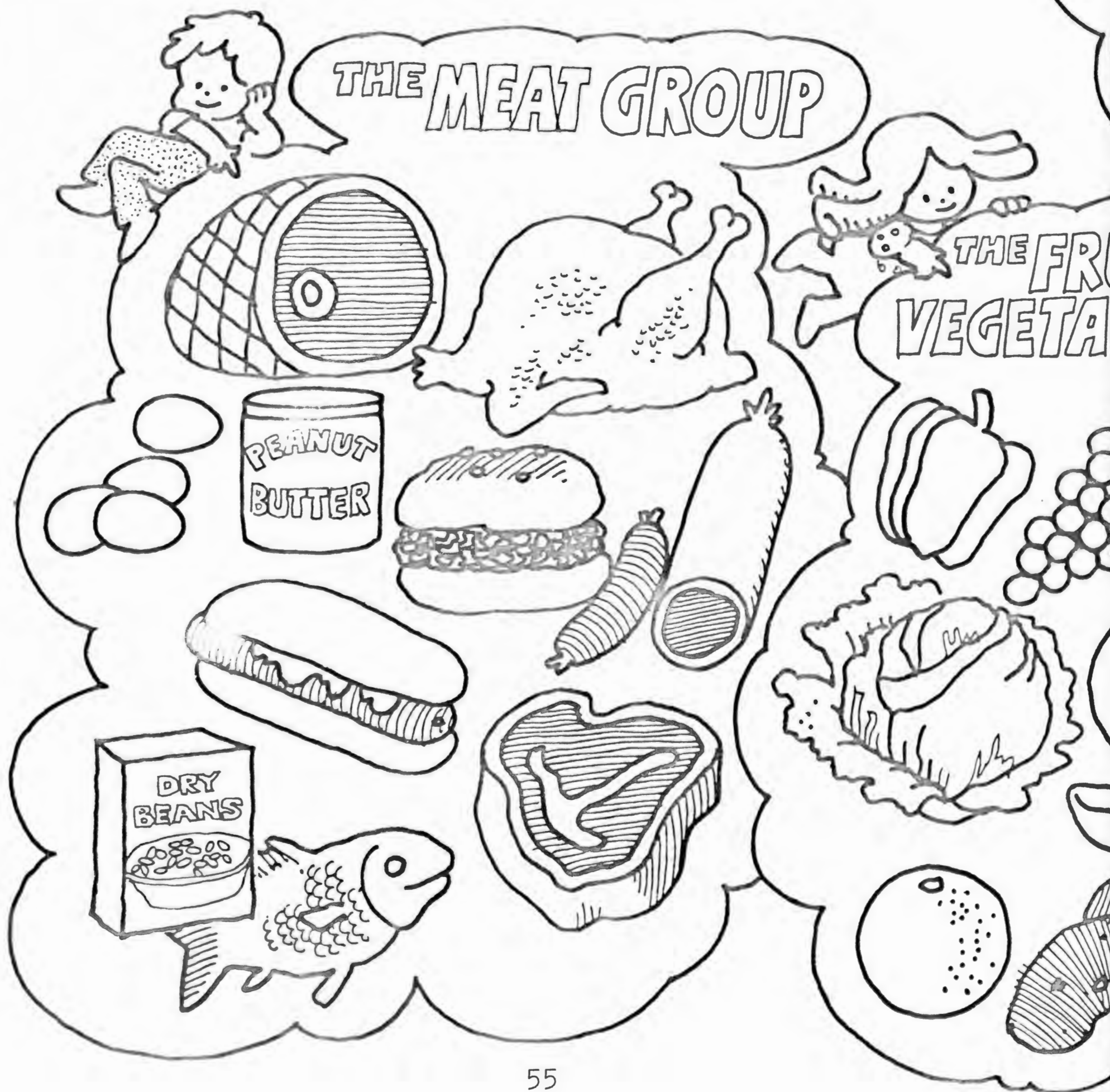


We thought about all the things that he'd said.
We thought about all the things that we'd read.
We thought about burgers *and* potatoes *and* beans
And orange juice *and* ice cream *and* cereals *and* greens.

So we said to ourselves
As we climbed down from that shelf:

"If we're going to be smart, be clever or shrewd,
We have to know there are four groups of food.

"To have healthy bodies for work, sleep or play,
Eat many good foods from four groups every day."



THE CEREALS AND BREAD GROUP



THE MILK GROUP



Professor Eckwoose is gone from our home,
And where he is now is not really known.
He knows all about food, so there's no cause to fret
Unless by some chance, he again should forget.
And then just maybe, could possibly come true,
That the dear old professor would visit you too.

If the jam's on your top shelf, keep this book behind it,
So Oonoose Q. Eckwoose will know where to find it.

Dear Parents,



Eat the basic 4 foods every day.



I hope you enjoyed reading **The Thing the Professor Forgot** and will read it often to your children. It's re-reading that really lets the Professor teach his simple, but important, nutrition message. As an adult, however, you have to know more about important family nutrition. The following paragraphs introduce the Basic Four Food Groups. Everybody needs the same kinds of food, but in different quantities. Small children need smaller portions. Teenagers may need extra large servings or seconds.

**"If we're going to be smart, be clever or shrewd,
We have to know there are four groups of food."**



THE VEGETABLES AND FRUITS GROUP

Contains all fruits and vegetables. These foods are some of the best sources of vitamin C and vitamin A. They also provide fiber. Choose four or more servings each day. Every other day, choose a dark-green or deep-yellow vegetable or fruit as a source of vitamin A.

Count as a serving: 1/2 cup of vegetable or fruit; or a portion as ordinarily served, such as 1 medium apple, banana, orange, or potato, half a medium grapefruit or cantaloupe, or the juice of 1 lemon.

THE MILK GROUP

These foods are good sources of calcium, phosphorus, protein, and riboflavin. Some milk products are good sources of vitamin A and vitamin D. Look for milk that is fortified with vitamins. Cheese, ice cream, and ice milk can replace some of the milk. In general, daily recommended amounts vary according to age and special conditions as follows:

Children under 9 2 to 3 cups*
Children 9 to 12 3 or more cups
Teenagers 4 or more cups
Adults 2 or more cups
Pregnant women 3 or more cups
Nursing mothers 4 or more cups

*1 cup = 8 oz.

THE MEAT GROUP

Contains meat and other protein-rich foods. These foods are also sources of iron and certain B vitamins. This group includes: meat, poultry, fish, eggs, dry beans, dry peas, and peanut butter.

Count as a serving: 2 to 3 ounces of cooked lean meat.

THE CEREALS AND BREADS GROUP

Whole grain and enriched breads and cereals are good sources of iron, B vitamins and carbohydrates. They also provide worthwhile amounts of protein. Whole grain foods add fiber, too. The Cereal and Bread Group includes such foods as cereals, breads, cornmeal, macaroni, noodles, rice and spaghetti. Choose 4 or more servings a day.

Count as a serving: 1 slice of bread, 1 ounce ready-to-eat cereal, 1/2 to 3/4 cup cooked cereal, cornmeal, grits, macaroni, noodles, rice, or spaghetti.

Use Other Foods to round out meals and to satisfy appetites. Choose additional servings from the Basic Four Food Groups and other foods such as butter, margarine, salad dressing and oil, sauces, jellies and syrups. Children need enough food to support normal growth and development. Adults need enough to keep their bodies healthy and their weight at a level favorable to health and well being.

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APPENDIX C

Pretest

NAME _____ AGE _____ SEX _____ DATE _____

FOOD CHOICES:RECOGNITION: (YES OR NO)

- | | | |
|-----|------------------|-------|
| 1.) | 1.) Corn | _____ |
| 2.) | 2.) Carrots | _____ |
| 3.) | 3.) Cauliflower | _____ |
| 4.) | 4.) Celery | _____ |
| | 5.) Asparagus | _____ |
| | 6.) Tomato | _____ |
| | 7.) Broccoli | _____ |
| | 8.) Green Peas | _____ |
| | 9.) Lettuce | _____ |
| | 10.) Green Beans | _____ |

Posttest

FOOD CHOICES:RECOGNITION: (YES OR NO)

- | | | |
|-----|------------------|-------|
| 1.) | 1.) Corn | _____ |
| 2.) | 2.) Carrots | _____ |
| 3.) | 3.) Cauliflower | _____ |
| 4.) | 4.) Celery | _____ |
| | 5.) Asparagus | _____ |
| | 6.) Tomato | _____ |
| | 7.) Broccoli | _____ |
| | 8.) Green Peas | _____ |
| | 9.) Lettuce | _____ |
| | 10.) Green Beans | _____ |

QUESTIONNAIRE FOR VALIDATION OF TESTING PROCEDURES

- 1.) Please comment as to the appropriateness of the two tests relative to the curriculum.
- 2.) Please comment as to the appropriateness of the two tests relative to the age of the children.
- 3.) Please comment as to test characteristics including objectivity, reliability, and validity.
- 4.) Please comment as to the relativity of the scoring system developed.
- 5.) Please note any additional general comments you feel would be helpful.

APPENDIX D

RESULTS OF VEGETABLE SNACK CHOICES BY GROUP AND TRIAL

Group 1	13 subjects	Control Group
Group 2	15 subjects	Experimental Group

SOURCE	MS	DF	F	P
Total	1.2039	55	--	--
Between	1.7116	27	--	--
Groups	6.6753	1	4.390	.0436
Error (G)	1.5207	26	--	--
Within	.7143	23	--	--
Trials	7.1429	1	17.115	.0006
G by T	2.0059	1	4.806	.0354
Error (T)	.4174	26	--	--
G Mean	1	2	--	--
	1.3077	2.0		
T Mean	1.3214	2.0357		
G by T	1	2		
1	1.1533	1.4615		
2	1.4667	2.5333		

APPENDIX E

EFFECT OF SEX ON VEGETABLE SNACK CHOICES OF BOTH GROUPS

Group 1 18 subjects Males

Group 2 10 subjects Females

SOURCE	MS	DF	F	P
<hr/>				
Total	1.2039	55	--	--
Between	1.7116	27	--	--
Groups	.9143	1	.525	.5181
Error (G)	1.7423	26	--	--
Within	.7143	28	--	--
Trials	7.1429	1	15.873	.0007
G by T	1.1571	1	2.571	.1174
Error (T)	.4500	26	--	--
G Mean	1	2		
	1.5833	1.8500		
T Mean	1.3214	2.0357		
G by T	1	2		
1	1.3333	1.3333		
2	1.3000	2.4000		

APPENDIX F

RESULTS OF VEGETABLE RECOGNITION BY GROUP AND TRIAL

Group 1	13 subjects	Control Group
Group 2	15 subjects	Experimental Group

SOURCE	MS	DF	F	P
Total	2.7896	55	--	--
Between	3.9788	27	--	--
Groups	36.9788	1	13.167	.0015
Error (G)	2.7428	26	--	--
Within	1.6429	28	--	--
Trials	10.2857	1	8.640	.0068
G by T	4.7604	1	3.999	.0533
Error (T)	1.1905	26	--	--
G Mean	1	2		
	7.4231	9.0333		
T Mean	7.8571	8.7143		
G by T	1	2		
1	7.3077	7.5385		
2	8.3333	9.7333		

APPENDIX G

EFFECT OF SEX ON VEGETABLE RECOGNITION OF BOTH GROUPS

Group 1 18 subjects Males

Group 2 10 subjects Females

SOURCE	MS	DF	F	P
Total	2.8091	55	--	--
Between	3.8704	27	--	--
Groups	.7000	1	.175	.6817
Error (G)	3.9923	26	--	--
Within	1.7857	28	--	--
Trials	12.0714	1	10.823	.0032
G by T	8.9286	1	8.005	.0087
Error (T)	1.1154	26	--	--
G Mean	1	2		
	8.1667	8.4000		
T Mean	7.7857	8.7143		
G by T	1	2		
1	8.0000	8.3333		
2	7.4000	9.4000		
