A STUDY OF THE EFFECTIVENESS OF TEACHING METHODS USED IN A COLLEGE COURSE IN FOOD SELECTION AND PREPARATION

by

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The purpose of the study was to measure knowledge in various subject matter areas and to measure the ability of the student to apply knowledge to the solution of problems met at a subsequent date. Objectives for the course were set up and a testing program inaugurated. Analyses of results of the measurement program show that there is not a significant difference in achievement in subject matter areas, but in all situations in which the students were tested either formally or observed, there is evidence of the student's inability to apply knowledge. Therefore a method of attack which will give the student more activities and experiences in applying knowledge is recommended.

ACKNOWLEDGEMENTS

The writer wishes to express sincere appreciation to Miss Mabel V. Campbell, without whose interest, careful guidance and constructive criticism this study would not have been possible, and to Mrs. H. K. Surratt for her co-operation and assistance in carrying out the measurement program.

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CHAPTER I

The Problem

A study was made of the achievement of students enrolled in the course in Food Selection and Preparation as now offered in the Woman's College of the University of North Carolina.

The purpose of the study was: (1) to measure student knowledge of facts, principles, and technical vocabulary in subject matter areas commonly included in the course; (2) to measure the ability of the student to apply knowledge of facts and principles in new situations:

a. Course in Food Selection and Preparation.

b. Course in Meal Planning and Table Service.

c. The Home Management House.

The study included: (1) the setting up of course objectives; (2) the development of an evaluation program; (3) analysis of results; (4) recommendations for strengthening the course.

CHAPTER II

Review of Literature

Measurement in an Educational Program. Measuring progress in achieving objectives that have been set up and in evaluating the success of teaching materials and activities Spafford points out are purposes for which a testing program should be planned.[1]

Brown says: "... no real progress is likely to occur until it is possible to evaluate what the particular method or content accomplishes in terms of changed behavior on the part of pupils."[2]

Chadderdon says: "... the importance of adequate measurement in teaching is being recognized by most teachers, but that many are confused or discouraged by the many problems which are involved... Many have expected that measurement would give them exact answers to questions concerning attainment. Whether we shall ever arrive at that place is a debatable question, but we need not wait. There is much which can be done now that will give us assistance in teaching."[3]

Coon, in a report of studies relating to the college curriculum, quotes Eurick's comment on the value of the testing program at the General College of the University of Minnesota, which was that one of the significant outcomes of the examination project with its emphasis on course objectives as the basis for tests, is the increasing attention being given by instructors to the growth they are attempting to produce in

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1/ Ivol Spafford, Fundamentals in Teaching Home Economics pp.72-73.

2/ Clara M. Brown, Syllabus for Educational Measurement p.3.

3/ Hester Chadderdon, "Evaluation of Evidence in Measurement" Practical Home Economics Vol.XIII (1935) p. 373.

students.[4] Commenting on the statement of Eurick, Coon says: "... this surely is an outcome worth striving for in connection with the tradition which has permeated the colleges, that information is an end in itself, rather than a means towards the development of attitudes and abilities." [5]

Raths in defense of inaugurating a program of evaluation gives the following points: "If it is possible to develop methods of evaluation which will provide teachers with realistic pictures of student development; if these devices can be economically administered in terms of time with respect to both teachers and students; and if the resulting evidence gives to the teacher basis for directing the development of these students, then the program might be acknowledged as a valid contribution to educational activities."[6]

Brown says: "...while the potential values of measurement are often unattained, nevertheless, it has stimulated countless teachers and administrators to think more critically about what they are accomplishing, to analyze their objectives more carefully, and to improve both the materials and methods."[7]

Phillips says: "... we need more analysis of specific observable teaching acts and pupil activities. An impersonal objective evaluation of our teaching results would help teachers to grow and improve in ability. An evaluation of teaching that does not encourage the teacher

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4/ Beulah I. Coon, "A Survey of Studies Related to the College Curriculum in Home Economics" Journal of Home Economics Vol. XXIX (1937) p. 156.

5/ Ibid.

6/ Louis E. Raths, "Evaluating the Program of a School" Educational Research Bulletin Vol. XVII (1938) pp. 57-59.

7/ Brown, op. cit., p. 4.

to critically analyze her own results and work for improvement is almost valueless."[8]

Hawkes points out that the value of examinations as a means of stimulating or enforcing improvement of teaching seems to have a different meaning for different people.[9] Teachers who have taught under the College Board System or the New York Regent System contend that standard-enforcing examinations, far from contributing to improvement of teaching, leads to its deterioration. These examinations concentrate on factual material, mere information to the neglect of the vital goals of education, such as growth, power, understanding, appreciation, and attitudes.

Douglas in discussing the effect of measurement on instruction says that the effect upon instruction can be wholesome only when the tests used measure progress towards all the objectives of the course in something like the proportion of their relative importance.[10] If and when tests may be employed which do measure in due proportion, or separately, all the important outcomes, the stimulating influence upon teachers and pupils is certain to be not only considerable but extremely desirable.

Keeler says: "... careful and sensible measurement has resulted many times in stimulating personnel to secure a better understanding of the learning process as it applies to various types of knowledge and the laws relative to the development of skills. It has stimulated

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8/ Velma Phillips, "Evaluating Our Teaching" Practical Home Economics Vol.VIII (1930) p.107.

9/ H. E. Hawkes, E. F. Lindquist and C. R. Mann, The Construction and the Use of Achievement Examination p.464.

10/ H. R. Douglas, "The Effects of Measurement on Instruction" Journal of Educational Research Vol.XXVIII (1935) p.493.

scientific curriculum construction and the selection of materials suited to the proper functioning of curriculum . . . All in all, it would seem that instruction and measurement should go hand in hand. Measurement divorced from instructional improvement is largely a waste of effort, but instruction without measurement can hardly hope to satisfactorily realize goals of achievement."[11]

Spafford points out that study for the sole purpose of answering questions is of little value.[12] If, however, the instructor sets up situations demanding certain learnings for success in achievement, this procedure may be of great value to the student and to the instructor.

Hawkes gives a somewhat different view of the matter. He says: "...an examination may constitute a minor, temporary incentive of real educational quality in cases where the students' task is congenial to his interests and capacities. . . . But what I have elsewhere called the 'political quiz' designed to enforce at least periodical industry upon unwilling students, can result only in 'cribs'....Morally there is supposed to be a vital distinction between these external and internal 'cribs' but so far as effective learning goes there is no substantial difference; in either case the student knows practically nothing about the course a few hours after he leaves the examination room."[13]

Chadderdon, however, says: "... measurement can serve to motivate learning. Teachers profess to be interested in developing individuals

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11/ L. W. Keeler, "Measurement and Instruction" Journal of Educational Research Vol.XXVIII, (1935) p.493.

12/ Spafford, loc. cit.

13/ Hawkes, op. cit., p.458.

who are increasingly capable of self-direction. If we have thought through what that means it will have very definite effects on measurement as well as other aspects of teaching. It implies that pupils see the importance of what they are learning and are concerned with their progress toward worthwhile goals. The teacher becomes a co-worker and not a task-master, tests become means of determining progress and not something to be crammed for or bluffed through .... We, as teachers who are sincerely interested in helping pupils develop along desirable lines, cannot fail to see the importance of measurement and to be challenged by its many possibilities."[14]

Setting up Objectives. Neither a teaching program nor an evaluation program can be developed except as it is based on a statement of objectives. Brown says: "..... before beginning to construct any test, obtain a clear understanding of what is to be tested. An instructor usually assumes that each student will undergo certain changes as a result of instruction, and the more specifically these changes can be described, the more nearly will an adequate understanding of objectives be reached."[15]

Chadderdon says: "..... the changes in behavior which most Home Economics teachers want to bring about will be in broader terms than ability to repeat more facts. Certain changes in attitudes, in abilities, in skills, in habits are important, if pupils are to learn to live more successfully in their family group."[16]

Aims and objectives, Huston points out, have been a part of plans

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14/ Chadderdon, op. cit., p289.

15/ Brown, op. cit., p.60.

16/ Chadderdon, op. cit., p.322.

for a good many years, but there has been a change in our interpretation of these words. Emphasis has shifted from subject matter as the real aim and objective; the girl and her behavior have become a matter of far greater importance in Home Economics instruction than mere subject matter. The latter has become only the tool for attaining the desired behavior.[17]

A clear formulation of objectives is essential, with definite statement regarding the kinds of changes that are desired. According to Brown there is no set form in which objectives should be states; it is necessary only that they be stated in understandable and definite terms.[18]

Hawkes discusses the problems usually involved in formulating the objectives of a particular course. One method is to get a list of objectives which is reasonably complete.... Another is to state the objectives in clear and definite terms so that they can serve as guides in the making of the examination questions. Definitely stated objectives lead to the selection of activities. In making a list of objectives for a course, one procedure commonly followed is to begin with the general function or purpose of the subject and to analyze this into its several aspects. Still another method is to begin with the content of the course and to ask questions about each topic: What is the purpose of this topic? What do I expect this to do to pupil behavior? In most cases it is necessary to use a combination of the two procedures in order to get a relatively complete list of important objectives and in

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17/ Hazel Huston, "Measuring Achievement in Home Economics" Journal of Home Economics Vol.XXIX (1937) p.19.

18/ Brown, op. cit., p.62.

order to clarify the meaning of each objective.

Method of Evaluating. Orata states that in recent years there has been a change .... "toward the development of a broader philosophy of evaluation with emphasis not on the relative merits of the various forms of tests, but on the kinds of evidence which indicate the attainment of various important outcomes of teaching."[20]

Dr. Tyler has defined a test as "anything that reveals the presence of the thing you are looking for." He defines a satisfactory test or examination as an instrument which gives us evidence of the degree to which students are reaching the objectives of the subject.

In discussing the evaluation instrument, Orata says: ".... they may be formal or informal records, complete or incomplete records: just as long as they give bits of significant and valid evidence of changes in the pupils; they are properly regarded as evaluation instruments."[22]

According to Brown, after one has decided what she wants to test, the next step is to indicate for each objective any methods by which she thinks she can obtain evidence of the extent to which it is realized. Interest may be checked by noting whether students desire to repeat the making of a product until a satisfactory standard has been reached or by noting the comments they make while they work in class; or by noting their interest in collecting recipes; none of which is very objective.

19/ H. E. Hawkes, E. F. Lindquist and C. R. Mann, op. cit., p.458.

20/ Pedro T. Orata, "Evaluating Evaluation" Journal of Educational Research Vol.XXXIII (1940) p.641.

21/ Ralph Tyler, Constructing Achievement Tests, p.14.

22/ Orata, op. cit., p.646.

Knowledge may be checked by reliable pencil and paper tests which measure vocabulary, familiarity with facts and principles underlying cookery processes, and student understanding of how these facts and principles explain the situation described.[23] Skills and habits may be checked by means of objective score cards or check lists.

Chadderdon also discusses methods of evaluation: "We cannot limit our thinking to paper and pencil tests, if we are to secure valid evidence of all significant changes. We must broaden our conception of measurement to include the securing of any reliable evidence of change. Observation of student behavior, both in class and under conditions other than in the class room, has many possibilities for learning how well our teaching is functioning. Behavior in unsupervised situations is a more valid evidence of learning. Formal tests may also be used to advantage in evaluating results of learning.... The types of tests that should be used depend on the objective to be measured.... Any learning exercise can be used as a testing situation."[24]

Huston gives the necessary steps in a measurement program as outlined by Dr. Tyler:

1. Determine the objectives for a particular course.
2. Set up testing situations which provide opportunity for the desired behavior to be expressed.
3. Develop a method for recording the pupils' responses.
4. Develop a method for evaluating the pupils' responses.[25]

23/ Brown, op. cit., p.64.

24/ Hester Chadderdon, "Planning a measurement Program" Practical Home Economics Vol.XIII (1935) p.373.

25/ Huston, op. cit.,p.20.

CHAPTER III

The Study

The study included: (1) The setting up of objectives; (2) the development of an evaluation program; (3) the analysis of results; (4) recommendations for strengthening the courses in foods as now offered in the Home Economics department of the Woman's College.

Procedure

Setting Up Objectives. The writer, who is the instructor in Meal Planning and Table Service and faculty director of the Home Management House, used the two techniques suggested by Hawkes in setting up the objectives: that of analyzing subject matter used in the course and that of analyzing the general purpose of the course.[1] The subject matter was analyzed as a basis for the objectives. The text,[2] also the most commonly used reference books,[3] were carefully reviewed. The general purpose of the course was determined through conference with members of the staff. This list of objectives was used as a basis for the teaching and evaluation program during the fall of 1940. It was then revised and used as a basis for the teaching and measurement program reported in this study (see Appendix p.61).

Development of the Evaluation Program. The writer followed the suggestion of Dr. Tyler in determining the methods of evaluation: that of setting up testing situations which provide opportunity for desired

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1/ H. E. Hawkes, E. F. Lindquist and C. R. Mann The Construction and the Use of Achievement Examinations p.8.

2/ M. M. Justin, L. O. Rust and G. E. Vail Foods.

3/ See Bibliography pp. 27-28.

behavior to be expressed.[4] The writer followed the suggestion of Brown[5] in determining the types of measuring instruments: that of checking knowledge and ability to apply knowledge in new situations, by reliable pencil and paper tests; skills and habits by means of objective check lists; interest and evidences of learning, by observation.

The pencil and paper tests, constructed under the guidance of the graduate adviser, were validated according to the suggestion given by Ruch.[6] They were judged by graduate adviser and members of the staff in the foods department, to see that they really measured the objectives that had been set up. The reliability of the tests was insured by having them typed; by having the length such that they could be completed within the available time; interdependence among items was avoided; directions were clear and concise; items were so stated as to avoid confusion.[7]

Thirteen pencil and paper tests were given to a group of forty students enrolled in the course in Food Selection and Preparation. Eleven of these tests were given immediately following the completion of the particular unit covered. One test, that on fats and oils, covered material that was not studied as a separate unit, but was subject matter which had been included in other units. The other was the final examination which covered material from various units of work studied throughout the semester. These pencil and paper tests included 1581 items distributed as follows:

4/ Ralph Tyler, Constructing Achievement Tests p.

5/ Clara M. Brown, Syllabus of Educational Measurement p.

6/ G. M. Ruch, The Objective or New-Type Examination pp.27-29.

7/ Standards set up by Clara M. Brown, Syllabus for Educational Measurement pp.47-48.

the total number of items measuring knowledge was 114, of which 578 were of facts; 135 of vocabulary, and 401 of principles. The number of items testing the ability of the student to apply knowledge was 466.

As a further measure of pupil achievement, tests designed to determine the ability of students to apply facts and principles to the solution of problems met at a subsequent date were given to two groups of students who had had the course in Food Selection and Preparation from one to several semesters earlier.[8]

The Minnesota check list for food preparation and service (see Appendix, p.59) was administered twice to a group of forty-one students in the course in Meal Planning and Table Service. In this course students worked in groups of four, in unit kitchens. Both problems were the planning, the preparation and the serving of a family dinner. Students were entirely responsible for planning the menu, the market order, the time management, and the meal service. Students were familiar with the check list. Each student scored herself and was scored by the writer and the instructor in Food Selection and Preparation.

The check list for food needs (see Appendix, p. 62) was given to a group, who previously had had both the course in Food Selection and Preparation and Meal Planning and Table Service and were living in the Home Management House. This check list was used to check seven weekly menus which had been planned at intervals throughout the semester.

The writer observed students under more or less uncontrolled situations in an effort to secure additional information concerning their ability to apply knowledge.

8/ Students had had this course at the Woman's College or a similar course elsewhere for which credit was accepted at the Woman's College.

ANALYSIS OF RESULTS

Test Given in the Course in Food Selection and Preparation. The tests results were analyzed to show the achievement of the total group. The achievement is in all cases reported in terms of the average percentage score made by the group. The following comparisons were made:

1. Achievement in various subject matter areas.
2. Achievement in tests measuring each knowledge and ability to apply knowledge when the test is given following a unit and when given at a later date.
3. Achievement in tests measuring knowledge of vocabulary, facts, and principles.
4. Achievement in tests measuring knowledge with ability to apply.
5. Achievement in tests measuring knowledge of principles of selection and principles of preparation in specified subject matter areas.

Table I
Student Achievement in Various Subject Matter Units Included in the Course in Food Selection and Preparation

Tests	Number of students	Number of test items	Mean number of items answered correctly	Percentage Score
A. Measuring	40	94	80.5	85.6
B. Food Preservation	39	81	69.2	84.4
C. Flour Mixture (Cakes)	39	112	92.2	82.0
D. Frozen Mixtures	40	31	24.2	78.1
E. Beverages	39	51	39.6	77.6
F. Cereal and Starch Cookery	40	120	92.8	77.3
G. Flour Mixtures (Breads)	40	179	139.4	76.8
H. Protein Cookery	39	145	114.8	76.5
I. Protein Cookery Continued	40	253	192.4	76.0
J. Sugar Cookery	40	47	35.4	75.0
K. Fruits and Vegetables	40	148	109.0	73.6
L. Final Examination	40	287	187.5	65.3
M. Fats and Oils	40	33	20.8	63.0
Total		1561	1195.7	75.3

As indicated in Table I, the average score in the thirteen tests (1581 items) varied from 63.0% to 85.6%, with an average of 75.3%. The difference between these two percentages has a critical ratio of 2.5, which indicates that the difference is not of statistical significance.

As indicated in Table II, there was a difference in the scores covering tests given immediately after the completion of a given unit and when given at a subsequent date. In the tests measuring knowledge the loss amounted to 14.4% (drop in score of from 78.6 to 64.2%). On the other hand, in the tests measuring ability to apply knowledge, the score made immediately after completion of the unit was 2.9% lower than on tests given later (63.8% as compared with 66.7%).

Even greater differences (score of 77.9% as compared with 63.0%) existed in the results in the eleven tests covering "just completed" subject matter and the one test covering "pulled out" subject matter.

Table II.
Achievement on Tests Classified According to the Time of Giving

	Number of Tests	Number of Items	Percentage Score
Total	13	1581	75.3
Tests given at the completion of a unit	11	1261	77.9
Tests given over subject matter included in other units	1	33	63.0
Final examination	1	287	65.3
Items measuring knowledge given:			
immediately after unit	11	1055	78.6
at subsequent date	2	59	64.2
Items measuring ability to apply given:			
immediately after unit	11	205	63.8
at subsequent date	2	261	66.7

As indicated in Table III and Figure 1, there is no significant difference as to scores showing achievement in items measuring knowledge of vocabulary, facts, and principles: 84.8% of items on knowledge of

vocabulary, 36.6% on knowledge of facts and 41.9% on knowledge of principles, were answered correctly by from 90-100% of the students; 23.7% of the items on knowledge of vocabulary, 24.0% on facts, and 16.7% on principles were answered correctly by from 80-90% of the students. Table III shows the percentage of correct responses below these discussed.

As indicated also in Table III and in Figure 2, the ability of the group to apply knowledge fell considerably below their achievement on items covering knowledge. Only 20.4% of total number of items covering application of knowledge as compared with 38.1% on knowledge, were answered correctly by from 90-100% of the students; 16.5% on application of knowledge, as compared with 21.3% on items covering knowledge only, were answered correctly by from 80-90% of the students. Table III also shows percentages of correct responses below these discussed.

Items measuring knowledge of principles of selection of protein foods, fruits, vegetables, and flour mixtures were pulled out from the total number of items on principles of selection and preparation. As indicated in Table IV and Figure 3, 51.4% of the items on principles of selection as compared with 37.3% of items on principles of preparation, were answered correctly by from 90-100% of the students; 13.4% of items on principles of selection (of specified foods) and 17.7% on principles of preparation were answered correctly by from 80-90% of students. As in the other tables, Table Iv also shows percentages of correct responses below these discussed.

Table III.
Number and Percentage of Items Measuring Knowledge of Vocabulary, Facts, and Principles and Ability to Apply Knowledge Which were Answered Correctly by Different Percentages of Students

Range of Percentages	Number of Items					Percent of Items				
	Knowledge				Application of	Knowledge				Application of
	Voc.	Facts	Prin.	Total	Knowledge	Voc.	Facts	Prin.	Total	Knowledge
90 - 100	47	210	168	425	95	34.8	36.6	41.9	38.1	20.4
80 - 89.9	32	139	67	238	77	23.7	24.0	16.7	21.3	16.5
70 - 79.9	18	80	56	154	84	13.3	13.8	13.9	13.8	18.0
60 - 69.9	15	44	40	99	70	11.1	7.6	9.9	8.9	15.0
50 - 59.9	6	47	20	73	44	4.4	8.1	4.9	6.5	9.4
40 - 49.9	6	6	27	57	44	4.4	4.6	5.9	5.1	9.4
30 - 39.9	4	17	17	38	32	2.9	2.9	4.2	3.4	6.8
20 - 29.9	4	8	3	15	14	2.9	1.3	0.7	1.3	3.0
10 - 19.9	3	6	4	13	4	2.2	1.0	0.9	1.1	0.8
0 - 9.9	0	0	2	2	2	0.0	0.0	0.4	0.1	0.4

Voc. = Vocabulary
Prin. = Principles

Figure 1

Percentage of Items Measuring Knowledge of Each Vocabulary, Facts, Principles Answered Correctly by Given Percentage of Students

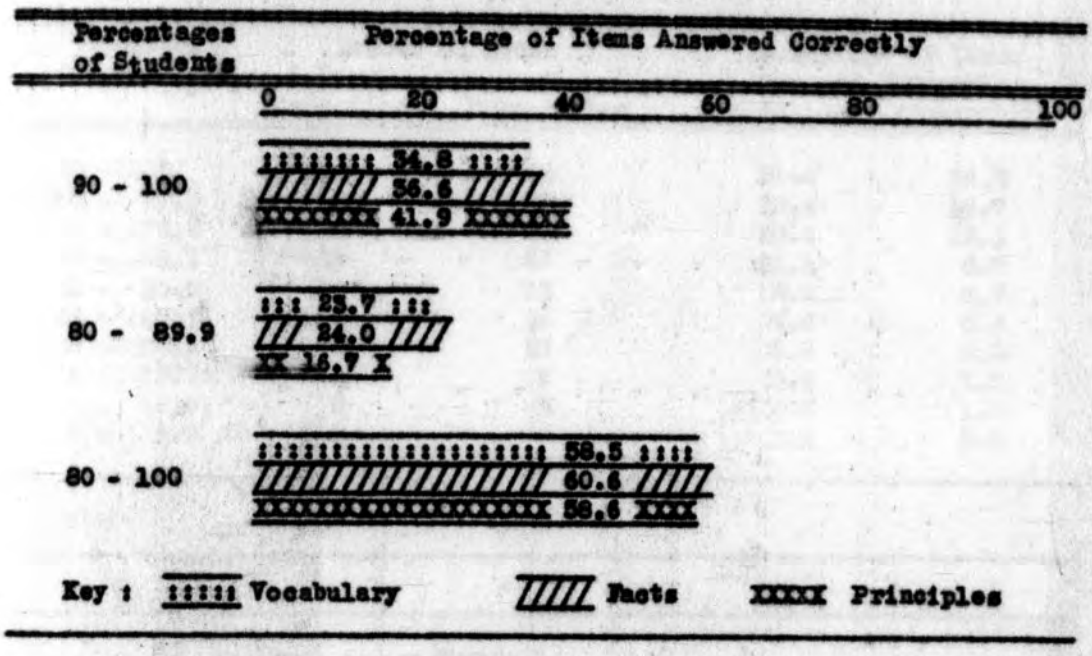


Figure 2

Percentage of Items Measuring Knowledge and Application of Knowledge Which Were Answered Correctly by Different Percentage of Students

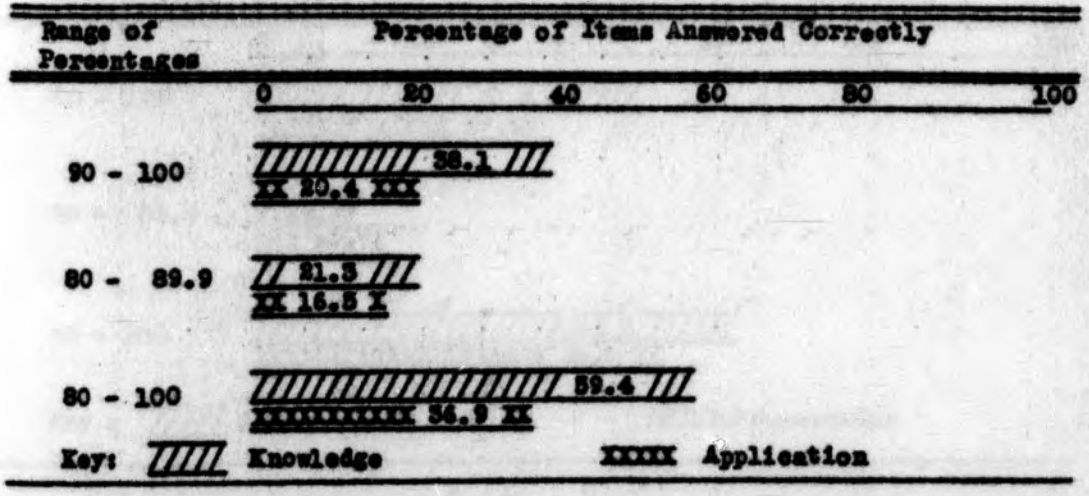


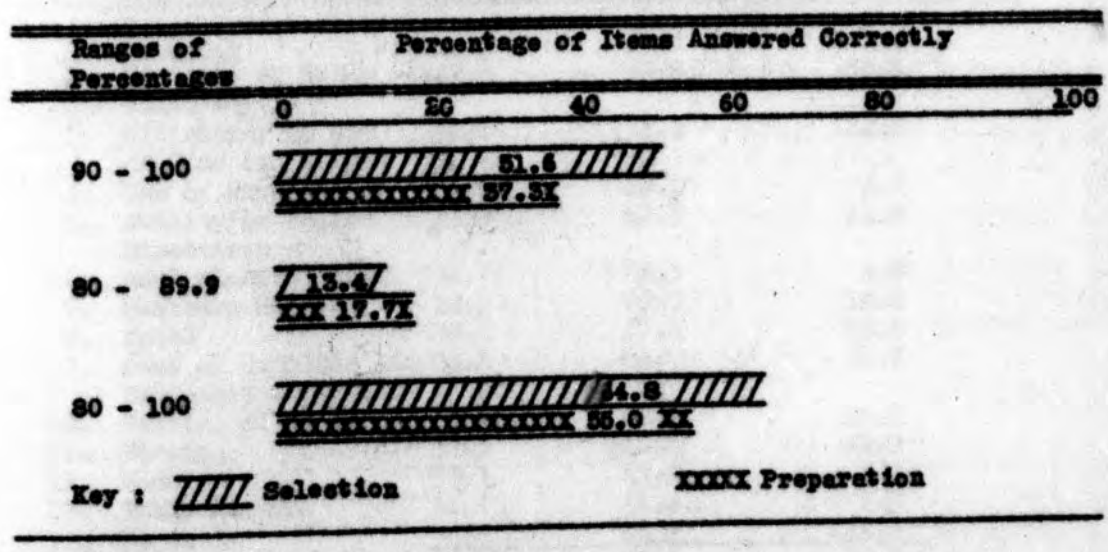
Table IV.

Percentage of Items Measuring Knowledge of Principles of Selection and Principles of Preparation of Protein Foods, Fruits, Vegetables, and Flour Mixtures, Which Were Answered Correctly by Different Percentages of Students

Range of Percentages	Number of Items		Percentage of Items Answered Correctly	
	Selection	Preparation	Selection	Preparation
90 - 100.	69	84	51.4	37.3
80 - 89.9	18	40	13.4	17.7
70 - 79.9	14	34	10.4	15.1
60 - 69.9	15	22	11.1	9.7
50 - 59.9	4	13	2.9	5.7
40 - 49.9	9	14	6.4	6.2
30 - 39.9	3	12	2.2	5.3
20 - 29.9	0	3	0.0	1.3
10 - 19.9	0	3	0.0	1.3
0 - 9.9	2	0	1.4	0.0
Total	134	225		

Figure 3

Percentage of Items Measuring Knowledge of Principles of Selection and Knowledge of Principles of Preparation of Protein Foods, Fruits, Vegetables, and Flour Mixtures Which were Answered Correctly.



Check List Used in the Course in Meal Planning and Table Service.

The check list was used twice. The data were analyzed to show the reliability of student judgment. Student score was based on the average of scores given by the writer (and instructor of Food Selection and Preparation) on the two projects referred to on p. 12. The ability of the student to recognize standards was based on the average of her judgment of her performance in the planning and preparation of these two meals. That there is marked evidence that the students do not recognize food standards of performance is shown by Table V and Figure 4, which give the comparison (of the scoring by the teacher and the student) of the latter's performance. It is significant that, of the fourteen items on the check list, the

Table V.

Percentage of Students Whose Judgment, as to Their Ability as Recorded on Fourteen items on a Five-Point Scale, Agreed with Instructor's Judgment Varied One Point, Varied Two Points

	Items	Pupils Agree	Pupils Vary One Point	Pupils Vary Two Points
1.	Grooming	46.3	51.2	2.4
2.	Neatness of Table while working	47.6	39.8	12.1
3.	Efficiency in Use of Time and Effort	30.6	54.8	14.5
4.	Use of Supplies	44.9	49.9	4.9
5.	Ability to Follow Directions	43.9	43.9	12.0
6.	Manipulative Skill	31.7	63.3	4.8
7.	Sanitary Habits	18.3	70.7	10.9
8.	Speed	38.6	47.4	13.5
9.	Care of Supplies and Equipment after use	24.1	64.7	10.9
10.	Setting of Table	31.7	52.4	15.8
11.	Serving	37.3	42.6	20.2
12.	Menu	53.3	45.0	1.2
13.	Table Manners	51.2	41.4	7.3
14.	Poise	36.6	48.7	14.6
	Mean	38.3	51.1	10.3

number of students who agreed with instructor's score, varied from 18.3 to 53.3% with a mean of only 38.3%. Of even greater significance is the fact that from 1.2 to 20.2% of the students varied by 2 points on a five-point scale from the instructor's score.

A further classification, made in an effort to discover special strengths and weaknesses in student judgment of standards, is included in Figure 4. The percentage of student-instructor agreement is very close on the three classifications; student behavior (38.1%), manipulative skills (41.3%), and managerial ability (41.9%). Likewise there is little difference between the three classes as to the percentage who differed from the instructors' score by two points (8.8, 9.4 and 8.3%).

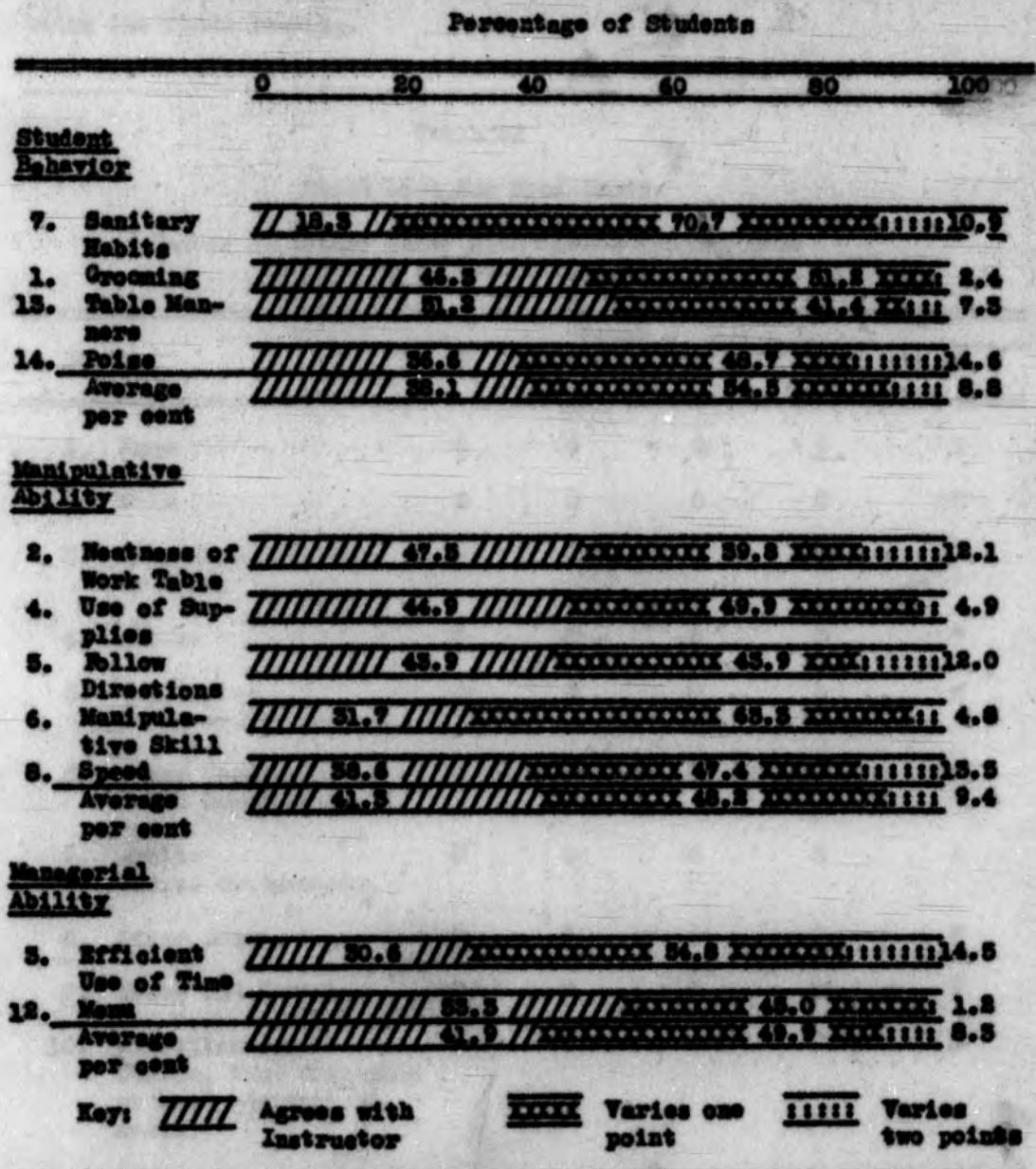
However, there are some noticeable differences within the classes. The most significant are the difference between student judgment on sanitary habits and grooming (18.3 as against 46.3% agreement with instructor's judgment). In the next class, manipulative ability, only 31.7% agreed with the teacher as to skill in manipulative processes, whereas there was 47.5% agreement as to neatness of working.

The most striking difference is found in the two items included under managerial ability. There is 53.3% teacher-student agreement as to student achievement in menu planning as compared with 30.6% in efficiency in use of time.

Check List Used in Home Management House. The check list was used to check seven weekly menus planned on cost levels ranging from thirty to fifty cents a day per person. The data were analyzed: the number of weekly menus with scores ranging from 0 to 4 on a five-point scale is shown.

Figure 4

Percentage of Students Whose Judgment as to Their Ability Agreed with Instructor's Judgment Varied One Point Varied Two Points on a Five Point Scale



As indicated in Table VI, five different menus scored four on the five-point scale, thus indicating the planning for the correct amount of food given as the standard for the given time; only one menu of the seven studied fell below the amount of green and yellow vegetables given as the standard; six menus scored three, other vegetables and fruits being the foods lacking.

Table VI

Check List for Food Needs

Number of Weekly Menus with Scores Ranging from 0 to 4 on a Five-Point Scale

Foods	Score 0	1	2	3	4
1. Eggs	0	0	0	6	1
2. Milk	0	0	0	0	7
3. Lean Meat, Poultry or Fish.	0	0	0	0	7
4. Butter	0	0	0	0	7
5. Vegetables Green or Yellow.	0	0	0	1	6
6. Other Vegetables Dried Beans or Peas.	0	0	0	3	4
7. Fruits Citrus or Tomatoes.	0	0	0	3	4
8. Other Fruits	0	0	0	0	7
9. Bread and Cereal	0	0	0	0	7
10. Miscellaneous Coffee, tea, coca-cola or candy (except at meals)	7	0	0	0	0

Observation of Students in Meal Planning and Table Service and in the Home Management House. Subjective judgment of this observation is reported as additional information concerning the students ability to apply knowledge. The following observations were made of students in both situations:

1. Preparation and Serving of meals.
2. Time management.
3. Food buying habits.
4. Care and storage of food.
5. Cooperation and dependability.

Observation of students showed: unsatisfactory habits of the storage of raw and of cooked foods; a need of supplementary experience in application of principles of preparation of certain foods. The group as a whole showed an increase in interest in standards of preparation and service of foods; a greater appreciation of the esthetics of food; a splendid co-operation and exceptional ability when given an opportunity to assume responsibility.

CHAPTER IV

SUMMARY

The purpose of this study was to measure student knowledge of vocabulary, facts, and principles in subject matter areas commonly included in the course in Food Selection and Preparation and to measure the ability of the student to apply this knowledge to the solution of problems met then and at a subsequent date. Objectives for the course were set up in terms of student behavior. Pencil and paper tests were constructed and administered. The results were analyzed to show the achievement of the group. The findings from the analysis of these tests must be interpreted with a clear understanding that the tests used in the study were not standardized, viz., that the validity and reliability have not been determined statistically.

Additional information concerning student ability to apply knowledge was secured by the use of the Minnesota Check list for Food Preparation and Service in the course in Meal Planning and Table Service; by the use of a check list for food needs in the Home Management House; by observation of students in both of the above situations.

The formal tests given to the class of forty students in the course in Food Selection and Preparation showed:

1. Greater mastery of knowledge than of ability to apply knowledge.
2. Considerable loss in retention of knowledge in even the short interval of time included in the course.
3. A slight increase in ability to apply knowledge at a subsequent date rather than immediately following completion of a unit.
4. No significant difference in achievement in various subject matter areas.

The tests given and also the uncontrolled observation of the work of the two groups who had previously had the course in Food Selection and Preparation showed:

1. Considerable lack of ability to recognize good standards of performance in responsibilities classified: as student behavior, as manipulative skill, as managerial ability.
2. Marked ability to apply knowledge in planning meals on different cost levels that are nutritionally adequate.
3. An increase in interest in standards of preparation and service of foods; a greater appreciation of the esthetics of food; a splendid co-operation and exceptional ability, when given an opportunity to assume responsibility.

Results of the analyses of all testing situations showed a very definite need for a method of attack which will give the student more activities and experiences in applying knowledge. The writer feels that the measurement program has made the students more conscious of the objectives of the course and the purpose of each experience; that the instructors in foods are more conscious of specific teaching objectives and more conscious of student needs for growth and development rather than mere acquiring of skills and information.

RECOMMENDATIONS

In concluding this study the writer offers the following recommendations:

1. That continued evaluation of the objectives be made.
2. That further study and revision of subject matter be made.
3. That more recognition of the interrelationship of objectives and activities and experiences be given.
4. That more effective learning experiences be provided in order that the objectives set up might be more efficiently achieved. The writer suggests particularly, more experience in food purchasing, more individual responsibility for time management in preparing and serving food.
5. That a program of guidance be developed to enable the student:
   (a) to appreciate in the beginning, the value of certain knowledge as a basis for success in achievement throughout the course;
   (b) to carry a large responsibility for securing knowledge and for securing needed supplementary experiences necessary for the functioning of this knowledge.

BIBLIOGRAPHY

A. Books and Periodicals

BROWN, CLARA M. "Appraisal of Trends in Home Economics Education Research". Journal of Home Economics, Vol. XXIX (1937) pp. 603-606.

_____. Syllabus for Educational Measurement. Minneapolis: University of Minnesota Press, 1938.

COON, BEULAH I. "A Survey of Studies Related to the College Curriculum in Home Economics". Journal of Home Economics, Vol. XXIX (1937), pp. 156-159.

_____. "Criteria for Evaluating Content in Home Economics". Journal of Home Economics, Vol. XXVI (1934), pp. 142-148.

CHADDERDON, HESTER. "Measurement in Home Economics Education". Practical Home Economics, Vol. XIII (1935) pp. 289, 308-09.

_____. "Planning a Measurement Program". Practical Home Economics, Vol. XIII (1935), pp. 322, 341-42.

DOUGLAS, HARL R. "The Effect of Measurement Upon Instruction". Journal of Educational Research, Vol. XXVII (1935), pp. 508-10.

HAWKES, H. E., LINDQUIST, E. F., and MANN, C. R. The Construction and Use of Achievement Examinations, Boston: Houghton Mifflin Co. (1936).

HUSTON, HAZEL H. "Measuring Achievement in Home Economics". Journal of Home Economics, Vol. XXIX (1937), pp. 19-23.

KELLER, L. W. "The Effect of Measurement Upon Instruction". Journal of Educational Research, Vol. XXVIII (1935), pp. 508-10.

McCALL, W. A. How To Measure in Education. New York: The MacMillan Co. (1922).

ORATA, PEDRO T. "Evaluating Evaluation". Journal of Educational Research, Vol. XXXIII (1940), p. 641.

RATHS, LOUIS E. "Evaluating the Program of a School". Educational Research Bulletin, Vol. XVII (1938), pp. 57-59.

RICHARDSON, M. W., STALNAKER, J. M. "Comments on Achievement Examinations". Journal of Educational Research, Vol. XXVIII (1935), p. 425.

RUCH, G. M. The Objective or New Type Examinations. Scott, Foresman and Company, (1929).

SEGAL, DAVID "Some Newer Practices in Evaluation". School Life, Vol. XXVI (1941), p. 269.

SPAFFORD, IVOL Fundamentals in Teaching Home Economics. New York: John Wiley and Son (1935), Chap. XIII.

TYLER, RALPH W. Constructing Achievement Tests. Columbus. The Ohio University Press (1934).

B. Text for the Course in Food Selection and Preparation

JUSTIN, M. M., RUST, L. O., VAIL, G. E. Foods. New York: Houghton Mifflin (1940).

C. Commonly Used Reference Books

BAILEY (McLEAN) N. BETH Meal Planning and Table Service. Peoria: The Manual Arts Press, (1936).

CHILD, A. M., NILES, K. B. Food Preparation Studies. New York: John Wiley and Sons Inc. (1938).

HALLIDAY, E. G. and NOBLE, I. T. Hows and Whys of Cooking. Chicago: The University of Chicago Press (1939).

MONROE, DAY, KYRK, HAZEL, STONE, U. B. Food Buying and Our Markets. New York: M. Barrows and Co. Inc. (1940).

STANLEY, L., CLINE, J. S. Foods Their Selection and Preparation. New York: Ginn and Company (1935).

STEWART, J. J. Foods Production, Marketing and Consumption. New York: Prentice Hall Inc. (1938).

TERMINOLOGY USED IN FOOD PREPARATION. Washington: American Home Economics Association (1935).

WEST, B. F. and BOBYE, L. A Handbook for Food Preparation. New York: The MacMillan Co. (1937).

WILSON, J. S. and BATJER, M. Q. Food for The Family. New York: J. P. Lippincott Co. (1936).

APPENDIX

TEST A

Objective: To measure knowledge of facts and principles - measuring.

Directions: Check (x) each statement which is correct; and check (o) each statement which is incorrect.

I. The best methods of measuring flour are:

___1. Dip the measuring cup into the can of flour, level off with a spatula.

___2. Dip the cup into a bowl of freshly sifted flour; level with a spatula.

___3. Sift flour into a measuring cup, level off with a spatula.

___4. Fill freshly sifted flour into a cup with a tablespoon; level with a spatula.

II. To measure fat accurately:

___5. Cup should be completely filled with fat and leveled with a spatula.

___6. Fat should be packed into cup and leveled with a spatula.

___7. Melt fat and fill cup completely.

III. When a fractional part of a cup of solid food is to be measured:

___8. Use a glass measuring cup.

___9. Measure with a Tb.

___10. Use a fractional measuring cup.

IV. A standard measuring cup holds:

___11. 16 Tb.

___12. 14 Tb.

___13. 12 Tb.

___14. 15 Tb.

V. When measuring liquids use a standard measuring cup and fill:

___15. Only to rim of cup

___16. Till liquid overflows

___17. As full as can be filled without danger of spilling the contents when carefully handled.

VI. To measure brown sugar accurately:

___18. Fill cup full, level with a spatula.

___19. Sift sugar, then measure.

___20. Roll out lumps, measure by packing solidly into a cup.

VII. To measure confectioners sugar accurately:

___21. Sift sugar, then measure.

___22. Fill cup very gently.

___23. Roll, sift and fill cup with a tablespoon; level with a spatula.

VIII. Directions: In the blank at the left, give the approximate number of cups equivalent to 1 lb. of each product.

24.____ cups = brown sugar
25.____ cups = granulated sugar
26.____ cups = powdered sugar
27.____ cups = butter
28.____ cups = lard
29.____ cups = whole wheat flour (sifted)
30.____ cups = bread flour (sifted)
31.____ cups = pastry flour (sifted)
32.____ cups = coffee (coarsely ground)
33.____ cups = coffee (pulverized)
34.____ cups = cocoa
35.____ cups = tea

IX. Directions: In the blank at the left of each measure give the equivalent.

36.____ tsp. = 1 tablespoon
37.____ tb. = 1 cup
38.____ cup = 1 pint
39.____ pints = 1 quart
40.____ qts. = 1 gallon
41.____ tb. = 1 ounce
42.____ oz. = 1 pound
43.____ grams = 1 ounce
44.____ grams = 1 pound
45.____ grams = 1 kilogram
46.____ lb. = 1 kilogram
47.____ cc = 1 liter
48.____ fluid oz. = 1 pint
49.____ fluid oz. = 1 quart

X. Directions: In the chart below fill in the number or numbers which complete it correctly.

SOME COMMON COMMERCIAL CAN SIZES

Trade name of can	Approximate fluid weight of content	Cups per can	Approximate number of servings	Foods commonly available in each size can
8 oz. flat	50	51	52	53 54
Picnic (no.I Eastern)	55	56	57	58 59
No. 300	60	61	62	63 64
No. 1 tall	65	66	67	68 69
No. 2	70	71	72	73 74
No. 2½	75	76	77	78 79
No. 3	80	81	82	83 84
No. 5	85	86	87	88 89
No. 10	90	91	92	93 94

Objective: To measure knowledge of facts and principles - Food Preservation.

I. **Directions:** Below is given a list of terms used in food preservation. Following this list are descriptions or definitions of these terms. Read each definition or description, decide which term it defines or describes, find the term in the list and place the letter in the blank at the left.

a. Botulism	k. Open kettle
b. Brining	l. Pickling
c. Conserve	m. Pectin
d. Drying	n. Pectin test
e. Ensyme	o. Pasteurization
f. Freezing	p. Putrefaction
g. Fermentation	q. Pressure Cooker
h. Hot pack	r. Sterilization
i. Jam	s. Trichinosis
j. Jelly test	t. Vinegar

Definition and Descriptions

_____ 1. A carbohydrate substance which is necessary for making jelly; found in greatest quantities in slightly underripe fruit.

_____ 2. A method of canning by which foods are partially cooked before they are packed and then the cooking process is continued.

_____ 3. The mixture is properly cooked when syrup drops from edge of spoon in a sheet.

_____ 4. Preservation by a salt solution.

_____ 5. A method of canning by which foods are completely cooked, then placed into jars and sealed immediately.

_____ 6. Process of heating food to 143.6 deg. F or 62 deg. C. and maintaining that temperature for 30 minutes.

_____ 7. A utensil in which steam confined in a closed space will reach temperatures above 212 deg. F.

_____ 8. Preservative commonly used in pickles.

_____ 9. A mixture of fruits cooked with a large amount of sugar. Nuts are some times added.

_____ 10. Decomposition of carbohydrates, with the evolution of gas.

_____ 11. A dreaded kind of food poisoning caused by eating products in which poison or toxins have been developed by an organism.

____12. Decomposition of organic substances, chiefly of highly complex nature like proteins, under the influence of bacteria.

____13. Reducing the water content of food products to such a degree that development of the ordinary micro-organisms responsible for decay is checked.

____14. A disease caused by eating insufficiently cooked pork.

II. Directions: Below is given a list of fruits. Check (x) fruits which usually contain sufficient acid and pectin to make good jelly. Check (o) fruits which do not contain sufficient acid and pectin to make good jelly.

____15. Peaches

____16. Wild plum

____17. Concord grape

____18. Banana

____19. Pears

____20. Crabapples

____21. Winesap Apples

____22. Quinces

____23. Goose berries

____24. Cranberries

____25. Cherries

____26. Blackberries

____27. Strawberries

____28. Raspberries

III. Directions: Because of the dangers involved in the careless handling of the pressure cooker, the following important steps should be followed:

_____ 29.

_____ 30.

_____ 31.

_____ 32.

_____ 33.

_____ 34.

_____ 35.

_____ 36.

_____ 37.

_____ 38.

_____ 39.

_____ 40.

IV. Directions: Below is given a list of types of fruits and vegetables which are commonly canned. In blank A at the left, give an example of each type of food. In blank B, give the preferred method of processing. In blank C, give reason for choice of each method.

_____	41.	_____	42.	_____	43.	a. Soft fruit
_____	44.	_____	45.	_____	46.	b. Hard fruit
_____	47.	_____	48.	_____	49.	c. Acid vegetable
_____	50.	_____	51.	_____	52.	d. non-acid vegetable
_____	53.	_____	54.	_____	55.	e. Starchy vegetable
_____	56.	_____	57.	_____	58.	f. Protein food

V. Directions: In the blank at the left of each statement give the words or degrees F required to complete the statement.

_____ 59. a. Three conditions under which bacteria thrive best are:

_____ b.

_____ c.

_____ 60. The thermal death point of non-spore forming bacteria is usually

_____ 61. Optimum temperature for growth of bacteria is between

_____ 62. Growing or vegetative forms of bacteria cannot survive for any length of time at or above

_____ 63. The growth of microorganisms is almost completely stopped at temperatures near

_____ 64. Mold and yeast spores are easily killed by a temperature of

_____ 65. Enzymes are destroyed by heating for a short time to

_____ 66. The normal ripening of fruits, vegetables and meats is brought about by

_____ 67. a. The amount of pectin in fruit juices to be used for jelly may be determined by the use of sugar

_____ b. plus either of the two following substances.

VI. Directions: Check (x) statements which are correct; check (o) statements which are incorrect.

_____ 68. Yeasts thrive best in a sweet medium.

_____ 69. Temperature and time necessary for sterilization depend upon the composition of the food.

_____ 70. Bread boxes should be aired frequently.

_____ 71. Increasing either the acid or the pectin increases the stiffnes of jelly.

_____ 72. Do not add too much water when extracting pectin.

_____ 73. Boil fruit a long time to extract pectin.

_____ 74. Spoilage will not take place if 50% moisture content is removed.

_____ 75. Processing is the cooking or heating of food which has been packed in a container.

_____ 76. Blanching is driving the air out of the filled containers.

_____ 77. Exhausting is dipping a food for a short time in a quantity of hot water to reduce the bulk of that food.

VII. Directions: Give characteristics of a standard fruit jelly.

_____ 78. Color _____ 80. Form

_____ 79. Flavor _____ 81. Texture

Objective: To measure knowledge of facts and principles - Flour Mixtures (Cakes).

Directions: Below are given facts regarding cake making. In the space below make a brief explanation of the fact.

1. An ungreased pan of the right size is important for success in cooking cakes without fat.
2. A tube pan is better for baking cakes without fat.
3. An acid added to angel food cake strengthens the walls of air cells.
4. In sponge cakes the folding motion is used to mix the eggs with the other ingredients.
5. The conventional method of mixing produces a tender, velvet butter cake.
6. To produce a successful cake, as the proportion of sugar and fat is increased, either the eggs or flour or both of these ingredients must be increased also.
7. In making cakes, if butter and sugar are thoroughly creamed, less baking powder may be used.
8. When using the conventional method in mixing butter cakes, begin and end with flour when adding flour and liquid to sugar - butter mixture.
9. When making angel cake add some of the sugar to the beaten egg white before adding other ingredients.
10. A rich cake keeps longer than one with less fat.
11. Beat egg white to the stiff foam stage for angel cakes.
12. Eggs help to give a fine texture in cakes.
13. Moderate temperature is best for baking cakes.
14. Sour milk with soda, substituted for sweet milk, in cake making, gives a more tender texture.
15. Less than 24 hour or more than one week old eggs beaten at room temperature, are best to use in making angel cake.
16. Butter cakes should be allowed to remain in the pan not longer than 2 or 3 minutes after they are taken from the oven.
17. The cake batter should be spread so that it is somewhat thicker around the edges than in the center.

18. Small cakes and thin ones can be baked at a higher temperature than large cakes and thick ones.

19. Products made with honey as a substitute for sugar should have the liquid correspondingly reduced.

II. Directions: Below are given characteristics of cakes. Check (x) characteristics of a standard product. Check (o) characteristics of a product below standard.

a. Sponge cake:

Appearance	Texture	Flavor
__ 20. sunken top	__ 26. Fine grain	__ 32. highly flavored
__ 21. very rounded top	__ 27. coarse grain	__ 33. delicate flavor
__ 22. flat or slightly rounded top	__ 28. slightly moisture	__ 34. flat
		__ 35. eggs
__ 23. even delicate brown	__ 29. very light	
__ 24. dark brown	__ 30. very tender	
__ 25. slightly rough surface	__ 31. heavy	

b. Butter cake:

Appearance	Texture	Flavor
__ 36. cracked crust	__ 43. crumbly when cut	__ 49. well blended
__ 37. sugary crust	__ 44. not crumbly when cut	__ 50. delicate
__ 38. smooth surface	__ 45. velvety	__ 51. flat
__ 39. fine grained	__ 46. small holes evenly distributed	
__ 40. even thickness	__ 47. many large holes	
__ 41. slightly rounded top	__ 48. not too tender	
__ 42. uneven thickness		

III. Directions: Check (x) statements which are correct. Check (o) statements which are incorrect.

a. When adding beaten egg whites to a butter cake mixture, they should be:

____52. Beaten in.

____53. Folded in.

____54. Quickly stirred in.

b. Pans for sponge cakes should:

____55. Not be greased.

____56. Be lined with oiled paper.

____57. Be greased.

____58. Be floured.

c. A cake is sufficiently baked when:

____59. It shrinks slightly from the sides of pan.

____60. It is a golden brown color.

____61. The cake tester comes out of cake clean.

____62. When pressed gently with the fingers, it springs back.

IV. Directions: Below are given probable cause deviation from standard in butter cakes. Check (x) statements which are correct. Check (o) statements which are not correct.

a. The probable cause of a sticky crust:

____63. Too much sugar.

____64. Insufficient baking.

____65. Insufficient mixing.

____66. Too slow an oven.

____67. Too much baking powder.

b. The probable cause of coarse texture in butter cakes:

____68. Insufficient mixing.

____69. Too little sugar.

____70. Too much leavening.

____71. Too stiff a batter.

e. The probable cause of a tough cake:

____72. Too much mixing.

____73. Too much leavening.

____74. Lack of shortening.

____75. Too much flour.

____76. Too much sugar.

V. Directions: Butter cakes differ in richness and texture. Definite relationship between quantities of ingredients is important. Write in the blank at the left of each statement the information which completes it.

_____77. the amount of sugar in relation to flour.

_____78. the combined quantities of fat and milk in relation to quantity sugar.

_____79. amount of fat for each egg.

_____80. as amount of fat is increased, the quantity of milk is decreased.

_____81. as number of eggs increases, the quantity of b. p. decreases for each added egg.

_____82. as fat increases, the final stirring time.

VI. Directions: Having amounts of sugar and flour remain constant and number of eggs given, complete the diagrams below, giving the amounts of other ingredients according to the pattern recommended.

CAKE PATTERNS

I.

3 c. flour 1½ c. sugar
83.
1 egg
85. 87.
84. 86.

3 c. flour 1½ c. sugar
88.
4 eggs
90. 92.
89. 91.

II.

3 c. flour 1½ c. sugar
93.
2 eggs
95. 97.
94. 96.

3 c. flour 1½ c. sugar
98.
5 eggs
100. 102.
99. 101

III.

3 c. flour 103.	1½ c. sugar	3 c. flour 108.	1½ c. sugar
	3 eggs 105. 107.		6 eggs 110. 112.
104.	106.	109.	111.

Objective: To measure knowledge of facts and principles - frozen mixtures.

I. Directions: Below is given a list of terms used in connection with frozen mixtures. Following this list are descriptions or definitions of these terms. Read each definition or description, decide which term it defines, place its letter in the blank at the left.

TERMS

a. bisque	f. ices	j. over-run
b. custard	g. ice cream	k. stabelizer
c. fillers	h. mix	l. swell
d. frappe	i. mousse	m. sherbet
e. freezing mixture		n. parfait

_____ 1,2. The volume of ice cream obtained above the volume of the mixture before freezing.

_____ 3. Substances added to frozen mixtures to improve the body and texture by preventing formation of large ice crystals.

_____ 4. Substances added to ice cream to replace fat and milk solids.

_____ 5. Term applied to the mixture to be frozen.

_____ 6. A frozen dessert made of whipped cream, eggs cooked with hot syrup and flavored. It is frozen without stirring.

_____ 7. Term applied to the ice and salt used to freeze the mixture.

_____ 8. Whipped cream, sugar and flavoring frozen without stirring.

_____ 9. Fruit juice diluted with water, sweetened and frozen.

_____ 10. A sweetened diluted fruit juice frozen to a mushy consistency.

II. Directions: Below are given facts regarding frozen mixtures. In the space below each fact make a brief explanation of the fact.

11. Add a larger quantity of flavoring to frozen custards than to unfrozen.

Objective: To measure knowledge of facts and principles - frozen mixtures.

I. Directions: Below is given a list of terms used in connection with frozen mixtures. Following this list are descriptions or definitions of these terms. Read each definition or description, decide which term it defines, place its letter in the blank at the left.

TERMS

a. bisque	f. ices	j. over-run
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_____ 8. Whipped cream, sugar and flavoring frozen without stirring.

_____ 9. Fruit juice diluted with water, sweetened and frozen.

_____ 10. A sweetened diluted fruit juice frozen to a mushy consistency.

II. Directions: Below are given facts regarding frozen mixtures. In the space below each fact make a brief explanation of the fact.

11. Add a larger quantity of flavoring to frozen custards than to unfrozen.

12. Allow ice cream to ripen after it is frozen.

13. Fill freezer only two-thirds full.

14. Give Mix to be frozen a more intense color than is desired in the finished product.

15. Allow more room for expansion of ices than for an equivalent volume of ice cream.

16. The proportion of 1 part salt to eight parts of ice is generally recommended for the freezing mixture for ice cream.

17. While freezing, water should not be drained from the ice unless there is danger of its seeping into the frozen mixture.

18. Custards should be cooled before being put into the freezer and handle of freezer turned slowly at first.

19. The use of more than ½ to 1% gelatin in a mixture is objectionable.

20. Ice should be in small pieces in the freezing mix.

III. Directions: Check (x) statements which are correct. Check (o) statements which are not correct.

_____21. Mixtures that are high in sugar have a low freezing point.

_____22. One part salt to eight parts ice produces good results for frozen desserts which are not stirred.

_____23. The addition of cream is the most satisfactory method of reducing size of crystals in unstirred frozen mixtures.

_____24. Add nuts and fruits to ice cream at the beginning of the freeze process.

_____25. Homogenization of cream increases its freezing and whipping qualities.

_____26. Frozen products of fine texture are secured by the use of egg, gelatin, or evaporated milk.

_____27. For packing all types of frozen mixtures use 1 part salt to 3 to 4 parts ice.

_____28. The freezer should be filled about 3/4 full of ice before salt is added, then a mix of ice and salt is used.

_____29. From 3 to 5 minutes is usually sufficient for the slow turning period.

_____30. The quality of ingredients used in the mixture affects the finished product greatly.

_____31. The texture of desserts frozen in a mechanical refrigerator is improved by using a mix of low sugar concentration or by using a large proportion of stabilizers and by the incorporation of air in beaten egg whites.

TEST E

Objective: To measure knowledge of facts and principles - Beverages.

I. Directions: Tea is labeled according to grade and grade is determined by the position of the leaf on the stem. Below are given a list of grades of green, black, and oolong tea. Decide on the grade of each kind, place the letter in the blank opposite each phrase describing the location of the leaf.

NAMES OF GRADES

Green	Black	Oolong
a. Imperial	a. Pekoe	a. Fine
b. Gunpowder	b. Flowery Pekoe	b. Fancy
c. Young Hyson	c. Broken Orange Pekoe	c. Choice

Location of leaf	Green	Black	Oolong
End bud when very small	1. _____	4. _____	7. _____
Second leaf	2. _____	5. _____	8. _____
Third size leaf	3. _____	6. _____	9. _____

II. Define each of the following terms in the space below the term.

10. Theine
11. Tannin
12. Caffeol
13. Dutch process cocoa
14. Caffeine
15. Theobromine
16. Cocoa - tannin
17. Cocoa - nibs
18. Infusion
19. Mocha
20. Grind
21. English breakfast

III. Directions: Place in the blank at the left of the name of each type of coffee making container the letter indicating the grind suited for its type. No type maker uses more than one kind of grind, but certain grinds are used in more than one type make.

Type Maker	Type of Grind
_____ 22. Boiled coffee pot	a. Coarse
_____ 23. Drip pot	b. Fine
_____ 24. Percolator	c. Medium
_____ 25. Silex	

IV. Directions: In the blank at the left place the number or numbers which supply the information required. The amount to allow for each cup depends on the strength commonly desired for most people.

26. _____level Tb. for breakfast coffee per measuring cup of water.

27-28. ___to ___ level Tb. for after-dinner coffee per measuring cup of water.

29. _____tsp. tea per measuring cup of water.

30. _____Tb. cocoa per measuring cup of milk.

31. _____Tb. sugar per measuring cup of coffee.

V. Directions: In the blank at the left give the approximate amount that should be allowed for:

32. _____serving cups of beverage per lb. of coffee.

33. _____serving cups of beverage per ½ lb. of tea.

34. _____oz. coffee cream per cup of coffee.

35. ___to ___ slices per lemon (large) for tea.

VI. Directions: Check (x) each statement which is correct. Check (o) each statement which is incorrect.

a. A clear infusion of coffee with less tannin and with well developed flavor and aroma results when:

_____36. Made by drip method, allowing hot water to drip through the coffee only once.

_____37. Made by "boiled" method and egg shell is used to clarify.

_____38. Made by percolator method.

b. A tea infusion with the minimum amount of tannic acid and maximum amount of flavor or aroma results when:

_____39. The tea is boiled five minutes.

_____40. Tea is steeped five minutes.

_____41. Water just below the boiling point is poured over tea leaves, covered and let stand in a warm place for two or three minutes.

VII. Directions: Below are given facts and principles which afford a scientific basis for practices in the purchasing and preparation of beverages. In the space below each statement, give one example of a practice in which the principle applies.

42. Standing in contact with the air or prolonged boiling removes all of the air and dissolves gasses (CO_2) from H_2O.

43. The essential oils are volatile and their rate of loss is proportional to the temperature applied.

44. Fermentation of tea leaves decreases the solubility of tannin.

45. Caffeine is quickly soluble at a temperature below the boiling point (a range of 185 F. is considered best); tannin is readily soluble in boiling water.

46. The film of CO_2, (developed during the roasting process) which coats the coffee bean is lost when coffee is ground. This permits the escape of some of the essential oils which give coffee its flavor and aroma.

47. Acid bleaches the brown color which is characteristic of tannin.

48. Tannin dissolves in hot water and is precipitated when the beverage is cooled quickly.

49. Fat burns easily above 300 deg. F.

50. A skim which consists chiefly of calcium caseinate developes when milk is heated without agitation and exposed to the air.
a.
b.

51. Metals form metallic salts with the caffeine or theine and with the tannin or other glucosides during the period of extraction, in making tea and coffee.

Objective: To measure knowledge of facts and principles - Cereals and Starch Cookery.

Directions: In the chart below fill in the number or numbers which complete it correctly.

Types of Cereals	Examples	Amt. of Cereal	Amt. of Water-C	Amt. of Salt	Approx. Cooking Time		Amt. of Cooked Cereal
					Direct Heat	Double Boiler	
			1	2	3	4	5
Flaked	Rolled Oats	1c					
			6	7	8	9	10
Granular Wheat	Cream of Wheat	1c					
			11	12	13	14	15
Granular Corn	Hominy Grits	1c					
			16	17	18	19	20
Whole Direct Flame	Rice	1c					
			21	22	23	24	25
Whole Double Boiler	Rice	1c					

II. **Directions:** In the blank at the left of each sentence fill in the number which supplies the information regarding the preparation of alimentary pastes.

26. ____ to ____ cups of boiling water are required to each cup of material when cooking macaroni or other alimentary pastes.

27. ____ of salt is amount used to each cup of water.

28. ____ is approximate expansion of cooked product.

III. **Directions:** Write the correct letter in the blank at the left of each thickening agent to indicate the amount of each which is approximately equivalent to 1 Tb. of wheat flour.

_____	29.	Corn starch	a. 1 tb.
_____	30.	Stale bread crumbs	b. 2 tb.
_____	31.	Granular tapioca	c. 4 tb.
_____	32.	Pearl tapioca	d. 1½ to 2 tb.
_____	33.	Granular cereal	e. ½ to 3/4 tb.
_____	34.	Light brown flour	f. ¼ to ½ c.
_____	35.	Dark brown flour	g. 3 tb.
_____	36.	Uncooked rice	

IV. Directions: Below is given a list of starch products or products containing starch. Following this list is given facts and principles of starch cookery. As indicated by the numbers, some facts and principles apply to more than one product. Read each fact and principle, decide to which product or test it may apply, and place the letter in the blank at the left.

NAMES OF PRODUCTS

a. Acid test	g. Cocoa	n. Orange blanc mange
b. Brown sauce	h. Cream of wheat	o. Rice
c. Baked potato	i. Iodine test	p. Spaghetti
d. Carbohydrate test	j. Lemon pie	q. Tapioca
e. Corn starch pudding	k. Lemon sauce	r. Toast
f. Corn meal	l. Macaroni	s. Wheatena
	m. Oatmeal	t. White sauce

FACTS AND PRINCIPLES

_____ 37. In the presence of heat and moisture, flaked cereals absorb water and increase in bulk two times.

_____ 38,39. To prevent lumping of starch grains, fat is used to separate them before liquid is added.

_____ 40. Dry heat changes starch to dextrine.

_____ 41,42,43,44. To prevent lumping of starch grains, sugar is used to separate them before liquid is added.

_____ 45. A test which will determine the presence of starch in food.

_____ 46,47. Alimentary pastes are products made from durum wheat.

_____ 48,49,50. To avoid lumping, granular cereals should be stirred constantly when added to boiling water.

_____ 51. As starch is dextrinized it loses some of its thickening power, therefore an increased amount of thickening agent is required.

_____ 52,53,54. Acid boiled with starch results in a weaker jelly or thinner paste; therefore an increased amount of thickening agent is required when considerable acid is used.

_____ 55,56,57. To avoid lumping finely ground cereals may be mixed with a little cold water before adding to boiling water.

_____ 58,59,60,61. Sugar cooked with starch forms an increasingly soft gel with increasing amount of sugar.

V. Directions: Below are given characteristics of cooked cereals.
Check (x) characteristics of a standard product.
Check (o) characteristics of products below standard.

A. Consistency		Texture		Taste and Flavor	
____ 62.	Thick	____ 66.	Lump	____ 69.	Starchy
____ 63.	Tends to retain shape in dish when hot	____ 67.	No lumps	____ 70.	Salty
____ 64.	Thin	____ 68.	Gummy	____ 71.	Natural flavor well developed.
____ 65.	Pasty				

B. Check (x) the best procedures to obtain this standard. Check (o) the unsatisfactory methods of obtaining this standard.

____ 72. Pour cereal all at a time into rapidly boiling water.

____ 73. Add cereal slowly to rapidly boiling, salted water, stir whole and flaked cereals only as much as is necessary, using a fork.

____ 74. Stir cereal into cold water. Heat gradually to the boiling point without stirring.

____ 75. Start cereal cooking in hot water. Cook for one hour, stir constantly.

VI. Directions: Write the correct letter in the blank at the left of each food constituent to indicate the average percentage composition of cereal grains.

____ 76.	Carbohydrate	a.	10 - 12%	f.	30%
____ 77.	Protein	b.	65 - 75%	g.	90%
____ 78.	Fats	c.	50%		
____ 79.	Minerals	d.	½ - 8%		
____ 80.	Water	e.	2%		

VII. Directions: Write the correct letter or letters in the blank at the left of each part of the grain to indicate the composition of each.

____ 81,82,83,84.	Bran or outer covering	a. Cellulose b. Protein c. Starch d. Small amount of Vitamin B e. Large amt. of B1 f. Vitamin E. g. Fat h. Minerals
____ 85,86.	Endosperm	
____ 87,88,89,90,91.	Germ	

VIII. Directions: In the chart below fill in the number or numbers which complete it correctly.

Proportions of cornstarch required for desserts of different consistency:

Types	Amount Liquid	Amount Cornstarch
92. Sauce - medium	1c	
93. Cup dessert	1c	
94. Small mold	1c	
95. Large mold	1c	

IX. Directions: In the chart below fill in the number, word or phrase which completes it correctly.

Types	Liquid	Thickening Agent - Tb.	Fat Tb.	Seasoning or Flavoring Tsp.	Uses	Proportion for Use
		96	97	98	99	100
Very Thin	1c					
		101	102	103	104	105
Thin	1c					
		106	107	108	109	110
Medium	1c					
		111	112	113	114	115
Thick	1c					
		116	117	118	119	120
Very Thick	1c					

Objective: To measure knowledge of facts and principles - Flour Mixtures (Cakes).

I. Directions: Batters and doughs are classified according to the proportion of flour to liquid. Below are given types of dough. Complete the information called for in the chart.

Type	Proportions by Volume Liquid	Flour	Consistency	Examples
Pour Batter	1 part	1.	2.	3. 4. 5.
Drop Batter	1 part	6.	7.	8. 9. 10. 11. 12.
Soft Dough	1 part	13.	14.	15. 16.
Stiff Dough	1 part	17.	18.	19. 20.

II. Directions: Below are given kinds of flour used in making flour mixtures. In blank A at the left, place the name of the class of wheat from which each flour is made. In blank B at the left place the letters which indicate some of the uses of each kind of flour.

A	B	Kind of Flour	Use
_____ 21.	_____ 22. 23. 24.	Bread	a. biscuits b. cakes
_____ 25.	_____ 26. 27. 28.	All-purpose	c. griddle cakes d. loaf bread
_____ 29.	_____ 30. 31.	Pastry	e. noodles f. pie crust
_____ 32.	_____ 33. 34.	Semolina	g. rolls h. spaghetti
_____ 35.	_____ 36. 37. 38.	Graham	

III. Directions: Below is given three descriptions of oven heat with their appropriate temperatures. In the blanks at the left write the numbers of the products which you would bake at the various temperatures.

a. Slow 250° to 350°F.	b. Moderate 350° to 400°F.	c. Hot 400° to 450°F.
_____ 39.	_____ 43.	_____ 46.
_____ 40.	_____ 44.	_____ 47.
_____ 41.	_____ 45.	_____ 48.
_____ 42.		_____ 49.
		_____ 50.

1. biscuits
2. butter cakes
3. cookies
4. fruit cake
5. loaf of bread
6. fruit pie
7. meringue
8. muffins
9. popovers
10. pastry shells (unfilled)
11. rolls

IV. Directions: Check (x) statements which are correct. Check (o) statements which are incorrect.

Soda is usually added to take the place of baking powder in the following proportions.

_____51. ¼ tsp. soda for 1 cup medium sour milk.

_____52. ½ tsp. soda for 1 cup medium sour milk.

_____53. 1/3 tsp. soda for 1 cup of baking molasses.

_____54. ½ tsp. soda for 1 cup of baking molasses.

V. The general rule for levening 1 cup of flour is:

_____55. ½ to 1 tsp. of quick-acting (tartrate and phosphate) b.p.

_____56. 1½ to 2 tsp. of quick-acting (tartrate and phosphate) b.p.

_____57. 1 to 1½ tsp. of the slow acting (S.A.S.) baking powder.

_____58. 2 to 3 tsp. of slow acting (S.A.S.) baking powder.

VI. If muffins have tunnels when they are cooked you probably:

_____59. Did not add enough eggs.

_____60. Did not measure the flour carefully.

_____61. Beat them too much.

_____62. Used water instead of milk in the mixture.

_____63. Used insufficient leavening.

_____64. Over baked them.

VII. The method employed in combining ingredients in batter is:

_____65. Sift dry ingredients, add solid fat cut into small pieces.

_____66. Cream shortening, add dry ingredients.

_____67. Sift dry ingredients, add liquid and melted shortening to dry ingredients.

VIII. The leavening of batters and doughs is accomplished by:

_____68. The addition of sugar.

_____69. The addition of substances which react within the mixture to give off gas.

_____70. The addition of fat.

_____71. Steam.

_____72. Incorporation of air.

_____73. Fermentation due to the growth of yeast.

_____74. The addition of eggs with production of gas.

IX. The proportion of baking powder in a flour mixture may be affected by:

_____75. Consistency of the batter.

_____76. Kind of flour.

_____77. The oven temperature.

_____78. The kind of baking powder.

X. If the biscuits are tough and heavy they probably:

_____79. Have too high a proportion of fat,

_____80. Lack fat.

_____81. Over mixed.

_____82. Cooked in too slow oven.

_____83. Too stiff a dough

____63. Used insufficient leavening.

____64. Over baked them.

VII. The method employed in combining ingredients in batter is:

____65. Sift dry ingredients, add solid fat cut into small pieces.

____66. Cream shortening, add dry ingredients.

____67. Sift dry ingredients, add liquid and melted shortening to dry ingredients.

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____69. The addition of substances which react within the mixture to give off gas.

____70. The addition of fat.

____71. Steam.

____72. Incorporation of air.

____73. Fermentation due to the growth of yeast.

____74. The addition of eggs with production of gas.

IX. The proportion of baking powder in a flour mixture may be affected by:

____75. Consistency of the batter.

____76. Kind of flour.

____77. The oven temperature.

____78. The kind of baking powder.

X. If the biscuits are tough and heavy they probably:

____79. Have too high a proportion of fat.

____80. Lack fat.

____81. Over mixed.

____82. Cooked in too slow oven.

____83. Too stiff a dough.

XI. If waffles are tough and heavy:

____84. Too much mixing.

____85. Batter too stiff.

____86. Insufficient levening.

____87. Standing too long before cooked.

____88. Iron too hot.

____89. Lack of fat in batter.

XII. If popovers fail to "pop":

____90. Wrong proportion of ingredients.

____91. Baked too long.

____92. Oven not hot enough.

____93. Not mixed sufficiently.

XIII. Directions: It is usually possible to distinguish bread and pastry flour by their appearance and by testing their physical characteristics. Give this information in the chart below.

Type	Color	Texture	Water Absorption	Gluten Content
Bread flour	94.	95.	96.	97.
Pastry flour	98.	99.	100.	101.

XIV. Directions: Pans for different products require a different preparation. In the blank at the left of each product, place the letter which indicates the method used for that product.

PRODUCTS				METHODS	
____102.	Biscuit	____107.	Gingerbread	a.	greased
____103.	Butter cake	____108.	Loaf bread	b.	not greased
____104.	Cream puffs	____109.	Popovers	c.	greased and floured
____105.	Drop cookies	____110.	Pie crust		
____106.	Drop biscuit	____111.	Rolls		

XV. Directions: Below is given a technical vocabulary used in the study of flour mixtures. Define each term briefly in the space below the term.

112. Batter -

113. Bake -

114. Beat -

115. Cream -

116. Dough -

117. Durum -

118. Folding -

119. Gluten -

120. Knead -

121. Melt -

122. Mix -

123. Stir -

124. Tartrate baking powder -

125. Zymase -

XVII. Directions: Below is given a list of fats. In the blank at the left, place the letter which indicates the approximate per cent of each.

				APPROXIMATE PER CENT	
____126.	Bacon fat	____130.	Jewel lard		
____127.	Butter	____131.	Leaf lard	a.	100%
____128.	Chicken fat	____132.	Oleomargarine	b.	80% to 85%
____129.	Crisco	____133.	Vegetable compound		
		____134.	Wesson oil		

XVIII. Directions: Fill in the blanks at the left of each statement which completes it correctly.

Shortening:

135. _____ to _____ Tb. of shortening used for 1c. of flour in biscuits.

136. _____ to _____ Tb. of shortening used for 1c. of flour in muffins.

137. _____ to _____ Tb. of shortening used for 1c. of flour in plain pastry.

XIX. Flour Substitutes:

_____138. Amount of cake or pastry flour substituted for 1c. of bread flour.

_____139. Amount of bread flour substituted for 1c. of cake or past flour.

XX. Shortening substitutions:

_____140. Amount of 80% fat substituted for 1c. of 100% fat.

_____141. Amount of 100% fat substituted for 1c. of 85% fat.

XXI. Directions: Check (x) statements which are correct. Check (o) statements which are incorrect.

_____142. According to standards set up by the Federal Food and Drug Administration, baking powders must contain at least 12% available co2.

_____143. All baking powders liberate C02 at the same rate.

_____144. 1 tsp. of S.A.S. phosphate powder is used with 1 cup of flour in biscuits.

_____145. In batters such as popovers steam is the main levening agent.

_____146. All baking powders consist of baking soda, a substance having an acid reaction, and a starchy material.

_____147. A hot-water pastry will give a tender but crumbly crust.

_____148. Thorough mixing of fat and flour will make a pastry dough that can be easily handled and that will form a flaky product upon baking.

_____149. Dough becomes more elastic and loses some of its stickness if it is allowed to stand for a short time before kneading.

_____150. During the mixing and rising of yeast bread the optimum temperature is from 84 - 95 degrees F.

____151. All bleached flour entering interstate commerce must be marked as such.

____152. Straight flour and entire wheat are synonymous terms.

____153. Compressed yeast is in active form and when added to a batter it grows much more quickly than dry yeast.

____154. The levening produced by neutralising 1 tsp. soda with acid is equivalent to the levening of 4 tsp. b.p.

____155. 1/5 tsp. baking soda neutralizes 1 oz. of chocolate.

____156. For each cup of flour use from 1 to 2 tsp. of salt when unsalted shortening is used in batter and dough products.

____157. Remove loaf bread from the pan as soon as it is baked.

____158. Dough for loaf bread should feel soft and pliable after kneading.

____159. The sponge method is not used when dry yeast is the leavening agent.

____160. Yeast grows more rapidly and rolls or bread are softer when potato water is used as the liquid.

XXII. Directions: Below are given facts regarding flour mixtures. In the space below each fact make a brief explanation of the fact.

162. Hard wheat is best for yeast breads.

163. Yeast breads should be kneaded lightly but thoroughly.

164. It is less difficult to make muffins which are free from tunnels when whole wheat flour, bran, or corn meal is substitutad for part of the all-purpose flour.

165. A solid fat is desirable in the mixing of pastry.

166. Pastry dough can be rolled out more easily and will bake into a flakier crust if water and fat are cold when added to flour.

167. If the fat is not cut finely enough, pastry will be tough.

XXIII. Give the characteristics of a standard product of each of the following:

	Biscuits	Muffins	Yeast Rolls
Appearance	168.	172.	176.
Color - exterior	169.	173.	177.
interior	170.	174.	178.
Texture	171.	175.	179.

TEST H

Objective: To measure knowledge of facts and principles - Protein Cookery.

I. Directions: In the chart below write in each blank the one word which supplies the information required.

Protein	Classification Complete or Incomplete	Source
a. Albumin	1.	2. 3. 4.
b. Casein	5.	6.
c. Globulins	7.	8. 9.
d. Mucin	10.	11.
e. Vitellin	12.	13.

II. Directions: Check (x) statements which are correct. Check (o) statements which are incorrect.

Eggs are valuable in the diet because they:

_____ 14. Are an excellent source of a complete protein.

_____ 15. Are a source of calcium.

_____ 16. Are an excellent cource of fat in an emulsified form.

_____ 17. They furnish vitamin C.

_____ 18. Are rich in phosphorous.

_____ 19. Are rich in iron.

_____ 20. They furnish vitamin C.

III. When adding eggs to a hot mixture:

_____ 21. Put all the eggs into the hot, cooked mixture.

_____ 22. Add eggs one at a time to the cooked mixture.

_____ 23. Add slowly the hot mixture to the eggs.

IV. A soft custard should be cooked until:

_____ 24. It is stiff.

_____ 25. The curd has disappeared.

_____ 26. It coats the spoon

V. A satisfactory method for preparing hard cooked eggs in the shell:

_____ 27. Place an egg in a pint of boiling water and boil for ten to twenty minutes.

_____ 28. Place an egg in boiling water and place where the water will keep hot, but not boil, for twenty-five to thirty minutes.

_____ 29. Place an egg in boiling water and boil for twenty-five min.

VI. Directions: Eggs are graded for size. In the blank at the left of each size give the minimum number of ounces to the dozen.

_____ 30. Large; _____ 31. Medium; _____ 32. Small

VII. Directions: Below are given the effects of various temperatures on eggs. Identify the temperature range at which this effect takes place placing the letter in the blank at the left.

_____ 33.	Eggs freeze	a. 180
_____ 34.	Egg white give a greater volume and more stable form when whipped.	b. 149
		c. 140
_____ 35.	Suitable holding temperature for eggs on farm, home, or store.	d. 60 - 70
_____ 36.	Germ spot development starts.	e. 40 - 55
_____ 37.	Yolk coagulates.	f. 20 - 32
_____ 38.	White coagulates (undiluted).	g. 28
_____ 39.	White coagulates (diluted).	

VIII. Directions: Egg whites are beaten to different stages for different uses. In the blank at the left of each use write the letter which indicates its stage.

USES		STAGES
_____ 40.	Angel food cake	a. Unbeaten
_____ 41.	Coating	b. Slightly beaten (foamy); large air bubles; flows easily.
_____ 42.	Clarifying	
_____ 43.	Cake (quick method)	c. Stiff foam - air cells smaller flows if bowl is tipped; very shiny, glossy, and moist in appearance.
_____ 44.	Cooked frosting	
_____ 45.	Divinity	d. Stiff - no longer foamy; air cells very small; may slip slightly if bowl is tipped; still glossy, smooth and moist in appearance.
_____ 46.	Emulsifying	
_____ 47.	Hard meringue	
_____ 48.	Omelet (puffy)	e. Very white but dull; small flakes of curds beginning to show.
_____ 49.	Soft meringues	
_____ 50.	Souffles	
_____ 51.	Thickening	

IX. Directions: Below is given a diagram of an egg. In the blank at the left of each line directed to a part of the egg, write the name of that part[1].

1/ For diagram of egg see "Poultry, Eggs and Fish" (Household Finance Corporation Publication) No. I p. 16.

X. Directions: Mark (x) statements which are true; mark (o) statements which are not true.

_____ 61. The highest grade for eggs set up by U. S. Department of Agriculture is U. S. extra.

_____ 62. Grading of eggs by the department of Agriculture is done only at the request of shippers and marketing agencies.

_____ 63. The bloom of an egg should be removed before storage.

_____ 64. The size of the air cell is used as one indication of the freshness of an egg.

_____ 65. Egg shells are heavier if the hen's diet contains an abundance of calcium.

_____ 66. The grading of eggs in N. C. is compulsory.

_____ 67. Within each dozen eggs U. S. standards must be uniform in size.

_____ 68. The germ spot of U. S. extra eggs may be slightly visible.

_____ 69. High temperature causes egg products to be toughened and coagulation uneven.

_____ 70. The presence of fat interferes with the whipping of egg white.

_____ 71. The egg white is a more efficient emulsifying agent than the egg yolk.

_____ 72. Over beating egg whites decreases their leavening power.

_____ 73. One egg white measures about 2 Tb.

_____ 74. Evaporated milk is milk which has been subjected to a temperature high enough to destroy pathogenic bacteria.

_____ 75. Light cream contains approximately 30% butter fat.

_____ 76. The cooking temperature for baked custard should not be higher than 275 degrees F.

_____ 77. Gelatin is a complete protein.

_____ 78. Pulverized gelatin hydrates more rapidly than granulated gelatin.

_____ 79. Purchasing eggs by the pound is more accurate than purchasing by the dozen.

_____ 80. U. S. standard eggs are suitable for poaching.

____81. The air cell of S. S. special eggs must be 2/8 inch, localised, and regular.

____82. Eggs with brown shells are of better flavor and higher food value than white shell.

____83. The thicker whites give a more stable foam.

____84. Diluting egg or adding sugar does not raise the temperature of coagulation.

____85. The addition of salt increases the stiffness of beaten egg white.

____86. Cheddar cheese is high in both protein and fat and may be used as a meat substitute.

____87. Grade A pasteurized milk has an average bacterial count of not more than 30,000 per cubic centimeters.

____88. Whole milk is high in iron.

____89. Whole milk is an excellent sourece of calcium.

XI. Directions: Below is given a list of cheeses in common use. In blank A at the left place the letter which indicates the type of cheese. In blank B, place the number which indicates the country which produces it.

		Name	Types		Country	
90. _____	91. _____	Brie	A.	Hard	1.	America
92. _____	93. _____	Cheddar	b.	Semi-hard	2.	Belgium
94. _____	(5. _____	Cottage	c.	Soft rippened	3.	England
96. _____	97. _____	Cream	d.	Soft un-ripened	4.	France
98. _____	99. _____	Camembert			5.	Holland
100. _____	101._____	Edam			6.	Germany
102. _____	103._____	Cheshire			7/	Italy
104. _____	105._____	Gorgonzola			8.	Switzerland
106. _____	107._____	Limburger				
108. _____	109._____	Neufchatel				
110. _____	111._____	Roquefort				
112. _____	113._____	Parmeson				
114. _____	115._____	Stilton				

XII. Directions: Below are facts and principles which afford a scientific basis for the preparation of protein foods. In the space below each, give one or more practice as indicated by the number.

116. Albumin is slightly soluble in cold water.

117. Proteins of milk are coagulated by acid at room temperature.

118. The temperature at which skin develops when milk is heated and exposed to air varies with the fat content. The higher the fat content the lower the temperature the skin forms.

119. The proportion of gelatin to liquid depends upon type of gelatin.

120. The proportion of gelatin to liquid depends upon the temperature.

121. The proportion of gelatin to liquid depends upon the time.

XIII. Directions: Below is given a technical vocabulary used in the study of protein foods. Define each briefly in the space below the term.

122. Candling-

123. Coagulate-

124. Certified milk-

125. Cheddar-

126. Ferrous sulfide-

127. Fondue-

128. Homogenized milk-

129. Lactose-

130. Pasteurized-

131. Souffle-

132. Whip-

133. Whey-

XIV. Characteristics of a standard poached egg:

134. Appearance
a. White
b. Yolk

135. Consistency

136. Texture of white

137. Tenderness of white

XV. Characteristics of a standard hard cooked egg:

138. Appearance

139. Color
a. White
b. Yolk

140. Consistency
a. White
b. Yolk

141. Texture of yolk.

XVI. Characteristics of a standard puffy omelet:

142. Appearance

143. Color

144. Moisture content

145. Texture

TEST I

Objective: To measure facts and principles - Protein Cookery continued.

I. Directions: Below are given facts regarding the cooking of meats and meat products. Give a brief explanation of each fact in the space below the fact.

1. The fell, the thin papery skin over the outside of lamb roast, should not be removed from the leg.

2. Always place a roast in the pan with the fat side up.

3. A constant low oven temperature (300 deg. F) should always be used in roasting meat.

4. Pork is always cooked to the well-done stage.

5. Roasts should be large, compact, weighing not less than 3 - 3½ lbs.

6. In general roasts are cooked in an uncovered pan.

7. Roasts may be salted before or during the cooking period.

8. Only tender cuts of meat are desirable for roasting.

9. The best results are obtained with veal cookery when veal is cooked slowly for a long time by moist heat.

10. Gelatin dishes made with fresh pineapple will not congeal.

11. Gelatin is always softened in cold water before adding boiling water.

12. If a gelatin solution is beaten when it becomes thick, the volume of the mixture can be doubled.

13. The light meat of chickens and turkeys is more tender than the dark.

14. Poultry is more expensive than most meats.

15. All fish can be cooked easily and quickly by dry heat.

16. A young hen turkey is a better buy than a young tom turkey of the same weight.

17. Mature chickens (one year and up) should be cooked by moist heat at a low temperature 300 deg. F.

18. All poultry should be cooked to the well-done stage.

19. Fish is more digestible than many meats.

II. Directions: Check (x) statements which are correct; Check (o) statements which are incorrect.

A. In the cooking of less tender cuts of meat the following method is used for making meat more tender:

_____ 20. Pounding
_____ 21. Searing
_____ 22. Broiling
_____ 23. Use of acids in cooking
_____ 24. Cooking with moist heat
_____ 25. Roasting

B. Factors which determine the loss of weight during the cooking of a roast, and thereby the loss of juiceness and palatability are:

_____ 26. The kind of meat
_____ 27. The size and shape of the roast
_____ 28. The type of oven used.
_____ 29. The stage of doneness to which it is cooked

C. For safety in buying meats one should know that cuts from a sound animal:

_____ 30. Are odorless
_____ 31. Are of uniform shape
_____ 32. Free from spots or bruises
_____ 33. Firm and dry
_____ 34. Uniform in texture
_____ 35. Should show U. S. Inspection stamp

D. To be classified as tender, meat should:

_____ 36. Have a large amount of connective tissues
_____ 37. Have short, small fibers
_____ 38. Be well marbled with fat
_____ 39. Have little connective tissue

E. The initial searing of meat provides a means of:

_____ 40. Holding in the juices
_____ 41. Helping to develop a flavor on the surface of the meat.
_____ 42. Preventing shrinkage

III. Directions: Check (x) statements which are correct; check (o) statements which are incorrect.

_____ 43. Leave the pan uncovered when panbroiling chops.
_____ 44. Roasts should always be carved across the grain.
_____ 45. Steaks should always be carved across the grain.
_____ 46. Tender cuts of meat are more nutritious than the less tender cuts.
_____ 47. Rib and loin cuts are the most tender cuts in all meats.
_____ 48. Use 1 tsp of salt per pound in seasoning meat.
_____ 49. A flexible breast bone is an indication of an old chicken or turkey.
_____ 50. Milk fed chickens appear less fat then corn fed but are better flavored.

_____ 51. When purchasing chicken allow ¼ pound per serving.
_____ 52. There is an evidence of pin feathers on a young bird.
_____ 53. Freshness in pountry is indicated by a moist, soft condition of the feet.
_____ 54. A plump wide body with breast full and rounded is evidence of a good quality bird.
_____ 55. If fish is fresh, the flesh will adhere to the back bone.
_____ 56. Fish liver oils are the richest sources of vitamin A and D
_____ 57. The most satisfactory way to defrost frozen fish is to place it in the cooking pan while still hard.
_____ 58. Canned shrimp is the only fish product which has taken advantage of and is protected by a government inspection service.
_____ 59. Fish steaks are cut lengthwise from whole fish which have been sealed or skinned.
_____ 60. The shells of live clams and oysters are tightly closed all around.

IV. Directions: Below is given a drawing of a carcuss of beef, veal, lamb and pork.

a. In the margin at the left is given numbers corresponding to numbers of wholesale cuts of each. Identify cuts by placing the name of the cut in the blank at the right of the number.

b. In the space below each wholesale cut give retail cuts obtained from each wholesale cut.

BEEF

Names of wholesale & retail cuts	Drawing of wholesale cut
61. I.	See "Better Buymanship Series - Meat" No. VI. Household Finance Corporation 1940 p. 12.
62. a.	
63. b.	
64. c.	
65. d.	
66. II.	
67. a.	
68. b.	
69. III.	
70. a.	
71. b.	
72. c.	
73. d.	
74. IV.	
75. a.	
76. V.	
77. a.	
78. b.	
79. c.	
80. VI.	
81. a.	
82. b.	
83. c.	
84. VII.	
85. a.	
86. b.	
87. VIII.	
88. a.	
89. b.	
90. IX.	
91. a.	
92. X.	
93. a.	
94. b.	
95. c.	

VEAL

	Names of wholesale cuts; Names of retail cuts	Drawing of Wholesale cuts[2].
96.	I.	
97.	a.	
98.	b.	
99.	c.	
100.	II.	
101.	a.	
102.	b.	
103.	III.	
104.	a.	
105.	b.	
106.	IV.	
107.	a.	
108..	b.	
109.	V.	
110.	a.	
111.	b.	
112.	VI.	
113.	a.	

2/ See "Better Buymanship Series - Meat" No. VI. Household Finance Corporation 1940 p. 12.

LAMB

		Names of wholesale cuts; Names of retail cuts	Drawing of wholesale cuts. 3.
114.	I.		
115.		a.	
116.		b.	
117.	II		
118.		a.	
119.		b.	
120.		c.	
121.	III.		
122.		a.	
123.		b.	
124.	IV.		
125.		a.	
126.		b.	
127.	V.		
128.		a.	
129.		b.	
130.		c.	

3/ See "Better Buymanship Series - Meat" No. VI. Household Finance Corporation 1940 p. 20.

LAMB

	Names of wholesale cuts; Names of retail cuts	Drawing of wholesale cuts. 3.
114.	I.	
115.	a.	
116.	b.	
117.	II	
118.	a.	
119.	b.	
120.	c.	
121.	III.	
122.	a.	
123.	b.	
124.	IV.	
125.	a.	
126.	b.	
127.	V.	
128.	a.	
129.	b.	
130.	c.	

3/ See "Better Buymanship Series - Meat" No. VI. Household Finance Corporation 1940 p. 20.

PORK

	Names of wholesale cuts; Names of retail cuts.	Drawing of wholesale cuts. 4.
131.	I.	
132.		
132.	II.	
133.	a.	
134.	b.	
135.	c.	
136.	III.	
137.	a.	
138.	b.	
139.	c.	
140.	d.	
141.	IV.	
142.	a.	
143.	b.	
144.	V.	
145.	a.	
146.	b.	
147.	VI.	
148.	a.	
149.	b.	
150.	VII.	
151.	a.	

4/ See "Better Buymanship Series - Meat" No. VI. Household Finance Corporation 1940 p. 24.

V. Directions: In 1939 new grade names were adopted by United States Department of Agriculture. Grade names for veal, lamb, and mutton are alike. Beef has a different grading. Pork is not grade marked. Below are given the names of these meats. In the space below each, give the grade name of quality mark of that kind, from high to low.

A.

Grade names Veal, lamb, mutton	Grade name Beef	Quality mark Pork (individual cuts)
152. _____	158. _____	163. _____
153. _____	159. _____	164. _____
154. _____	160. _____	165. _____
155. _____	161. _____	166. _____
156. _____	162. _____	167. _____
157. _____		

VI. Directions: Characteristics of different kinds of meat differ in size of cut, color of lean, and in amount of texture of fat. Describe the characteristics of each kind in the blanks at the right.

Meat	Size of Cut	Color of lean	Texture or Amt. of fat
Beef	168.	169.	170.
Veal	171.	172.	173.
Pork	174.	175.	176.
Lamb	177.	178.	179.

VII. Directions: In selecting fish, freshness is of utmost importance. Below are given names of parts of a fish. In the blank at the left of each name write a word or words describing the appearance of a fresh fish.

DESCRIPTION	PARTS OF FISH
_____ 180.	Eyes
_____ 181.	Flesh
_____ 182.	Gills
_____ 183.	Scales
_____ 184.	Skin

VIII. Directions: For cooking purposes all meat is divided into tender cuts, which can be cooked by dry heat and less tender cuts which should be cooked by moist heat. Below is given a list of cuts of meat. In the blank at the left place the letter which indicates the cooking method best suited to the cut.

A. Beef	B. Veal	Method of Cooking
_____185. tenderloin	_____193. Leg	a. Dry heat
_____186. porterhouse	_____194. Loin	b. Moist heat
_____187. rump	_____195. shoulder chops	
_____188. flank steak	C. Lamb	D. Pork
_____189. sirloin steak	_____196. Shoulder	_____200. Ham
_____190. chuck roast	_____197. Leg	_____201. Bacon
_____191. Hamburg steak	_____198. Breast	_____202. Shoulder Chops
_____192. Round	_____199. Loin chops	_____203. Spareribs

IX. Directions: In selecting terms which are used in the study of meat and meat cookery. Define or describe each term in the space below the term.

204. Baste-

205. Braise-

206. Broil-

207. Bottom round-

208. Canadian Bacon-

209. Conformation-

210. Dry heat-

211. Finish-

212. Form-

213. Forcemeat-

214. Fricassee-

215. Heel of round-

216. Larding-

217. Moist heat-

218. Marbling-

219. Pan broil-

220. Picnic ham-

221. Roast-

222. Round purple stamp-

223. Ribbon stamp-

224. Sear-

225. Stewing-

226. Sweet breads-

227. Top round-

228. Truss-

I. Directions: In the chart below is given kinds of poultry generally available. In the blanks at the right of these names complete the information called for.

Kind of Bird	Dressed Weight	Approximate Age	Characteristics
CHICKENS			
Broilers	229.	230.	231.
Roasters	232.	233.	234.
Fryers	235.	236.	237.
TURKEYS			
Young Hen	238.	239.	240.

II. A. Characteristics of a standard cooked meat roast:

241. Appearance-

242. Color-

243. Moisture content-

244. Tenderness-

B. Characteristics of a standard gravy:

245. Color-

246. Consistency-

247. Texture-

248. Taste and flavor-

C. Standard for cooked bacon:

249. Color-

250. Form-

251. Texture-

252. Flavor-

253. Odor-

TEST J

Objective: To measure facts and principles - Sugar and Sugar Cookery.

I. Directions: Below is given a list of terms used in the study of sugars and sugar cookery. Following this list are explanations of definitions of each term. Read each definition or explanation, decide which term it defines or explans, find the term in the list and place the letter in the blank at the left.

TERMS

a. brittle	g. cerelose	m. invert sugar
b. brown sugar	h. dextrose	n. lactose
c. caramel	i. fondant	o. molasses
d. caramelize	j. fudge	p. sugar
e. cold water test	k. fructose	q. sucrose
f. corn syrup	l. glucose	r. thermometer test

EXPLANATIONS AND DEFINITIONS

_____ 1. The most accurate test for doneness in sugar cookery.

_____ 2. Product used as a preservation in jams and jellies.

_____ 3., 4. Crystalline candy.

_____ 5. To heat sugar for food containing sugar until brown color and characteristic flavor develops.

_____ 6. Cane sugar which is less highly refined than granulated sugar.

_____ 7. A disacchride sold on the market as granulated sugar.

_____ 8. Sugar found in milk.

_____ 9. A commercial glucose prepared by the hydrolysis of starch.

_____ 10. A residue left after the extraction of crystalline sugar from sugar cane.

_____ 11. Sugar prepared by the hydrolysis of sucrose.

II. Directions: Below is given a list of terms used for stages of sugar cookery. Following this list are descriptions of these stages when the cold water test is made. Read each description, decide to which stage it refers and place the letter in the blank at the left.

STAGES

a. crack	e. soft ball
b. hard crack	f. thread
c. hard ball	g. soft cruck
d. firm ball	h. brown liquid

DESCRIPTIONS

_____ 12. Ball flattens only slightly as it is held lightly between the first two fingers and the thumb.

_____ 13. Ball retains its shape, not spreading at all.

_____ 14. Ball formed is hard when it is pressed.

_____ 15. Syrup hardens to such a degree that it cannot be pressed into a thin, sheet but is brittle enough to break.

_____ 16. Syrup hardens as it touches the water and cannot be pressed into a ball, but can be pressed into a thin sheet, brittle enought to break.

III. Directions: Check (x) statements which are correct; check (o) statements which are incorrect.

_____ 17. Soak and wash dishes used in sugar cookery in hot water.

_____ 18. Fruit remains whole when cooked slowly in syrup because sugar toughens cellulose.

_____ 19. Candy syrups are supersaturated solutions.

_____ 20. One pound of granulated sugar measures three cups.

_____ 21. One pound of brown sugar measures 2-2/3 cups.

_____ 22. Sugar makes the crust of a flour mixture brown more readily.

_____ 23. The addition of cream of tartar or corn syrup to a sugar solution hastens crystalisation.

_____ 24. Candies which have a creamy texture such as fudge and fondant should be beaten after they have been cooled to 104 deg. F.

_____ 25. The boiling point of sugar solution is raised by adding substances such as corn syrup and chocolate.

_____ 26. Fondant undergoes ripening and becomes more pliable after 24 hours.

_____ 27. Lactose is the sweetest of all sugars.

_____ 28. Granulated sugar is 99 per cent carbohydrate.

_____ 29. Increasing the quantity of sugar in a custard mixture reduces the thickening power of eggs.

_____ 30. If the particles of powdered sugar are rather coarse it is designated as "xxxx powdered."

IV. Directions: Below are given facts and principles which afford a a scientific basis for the methods used in sugar cookery. In the space below each fact or principal make an explanation.

31. Use finely granulated sugar for making cakes rather than sugar that is coarsely granulated.

32. In flour mixtures such as griddle cakes and muffins the presence of sugar helps to prevent the occurrence of tunnels.

33. Fondant of smooth, creamy texture may be made of brown sugar without the addition of acid or corn syrup.

34. Crystals which form in crystalline candies become very large when allowed to cool slowly.

35. Invert sugar absorb moisture from the air more freely than do other sugars.
a.

36. b.

37. A two-quart sauce pan is desirable when two cups of sugar are used in making crystalline candies.

38. A sauce pan whole sides are straight is desirable in making crystalline candies.

39. The sugar used in the preparation of crystalline candies must dissolve completely before the boiling temperature is reached.

40. Syrup for most crystalline candies should be cooked without stirring.

41. When making crystalline candy beating must continue until crystallization is complete.

42. In non-crystalline candy a large amount of foreign materials such as milk, cream, or butter are used.

V. Directions: In the blank or blanks at the left of each sentence fill in the number or numbers which completes it correctly.

_____43. Tb. sugar for 1 c of liquid in most desserts.
____ to ____44. Tb. sugar for 1 c of liquid in ice cream.
____ to ____45. Tb. sugar for soft meringues for each egg white.
____ to ____46. Tb. sugar for hard meringues for each egg white.
____ to ____47. C. sugar for frosting for each egg white.

TEST K

Objective: To measure knowledge of facts and principles- Fruits and Vegetables.

I. Directions: Below are facts regarding the value of fruits and vegetables in the diet. In the space below each fact, give one or more reasons as indicated by the number.

1,2,3. Fruits stimulate the appetite and digestion because of:
a. b. c.

4,5. Fruits promote intestinal hygiene.
a.

b.

6. Fruits are sources of energy.
a.

7/ Fruits and vegetables maintain acid-base equilibrum.
a.

8. Fruits and vegetables are necessary to vitality and resistance to disease.
a.

II. Directions: A. Organic acids present in fruits give fruits the acid taste but yield an alkaline ash, except in fruits where the acid is in a form not readily burned. Below is given a list of fruits. Identify the acid found in each fruit by placing the letter in the blank at the left.

Fruits	Acids
_____9. Prunes	a. Citric
_____10. Pineapple	b. Malic
_____11. Lemons	c. Benzoic
_____12. Cranberries	d. Oxalic
_____13. Oranges	e. Tartaric
_____14. Apples	
_____15. Strawberries	
_____16. Grapefruit	
_____17. Grapes	

B. Identify the fruits which do not burn to yield an alkaline ash by placing the numbers in the

blank at the left.

_____ 18,19,20.

III. Directions: Below are given classifications of vegetables. In the blanks below each class give example of that class.

a. Composition as:

Starchy	Succulent
21. _____	23. _____
22. _____	24. _____

b. Flavor as:

Mild flavored	Strong flavored
25. _____	27. _____
26. _____	28. _____

IV. Directions: Below are given classifications of fruits. In the blank below each class give examples of that class.

a. Food fruits	b. Flavor fruits
29. _____	32. _____
30. _____	33. _____
31. _____	34. _____

V. Directions: Prunes are classified according to the number in a pound and are sold in the wholesale market by these numbers. In the blank at the left of each class give the numbers included in that class.

_____ 35. Extra large prunes.
_____ 36. Large prunes
_____ 37. Medium prunes
_____ 38. Small prunes

VI. Directions: Trade names for size of oranges are based on the number in a crate. In the blank at the left of each class give the numbers included in that class.

_____ 39. Large
_____ 40. Medium
_____ 41. Small

VII. Directions: Lemons are graded according to size in a crate. In the blank at the left of each class give the numbers

included in that class.

_____42. Large
_____43. Medium
_____44. Small

VIII. Directions: Cookery methods to prevent solubility loses are not as important in fruit cookery as in vegetable cookery. Check (x) in the correct reason; Check (o) in the incorrect reasons.

_____45. Less water is used in cooking.
_____46. Minerals are less soluble.
_____47. Liquid containing soluble minerals is served with the fruit.
_____48. Fruits are cooked at a lower temperature.

IX. Directions: Check (x) statements that are correct about frozen fruits and vegetables. Check (o) statements which are incorrect.

_____49. Frozen fruits are always sweetened.
_____50. Frozen fruits are packaged whole, sliced, or crushed.
_____51. Frozen fruits should be used as soon as they are defrosted.
_____52. Frozen vegetables require a longer cooking period than fresh vegetables.
_____53. Vegetables should be hard frozen when added to boiling salted water.

X. Directions: Below are given characteristics of cooked dried fruits. Check (x) characteristics of a standard product. Check (o) characteristics of a product below standard.

Appearance	Moisture Content	Tenderness	Flavor
66 54. Hold shape	____58. 1 part Juice to 2 parts fruit	____60. Hard	____62. Tartness predominate
_____55. Shrunken		____61. Tender	____63. Sweetness predominate
_____56. Mushy	____59. 1 part Juice to 1 part fruit		
_____57. Plump			____64. Natural flavor retained

XI. Directions: Check (x) the best procedure to obtain this standard. Check (o) the unsatisfactory method of obtaining this standard.

_____65. Soak fruits, change water and cook slowly.
_____66. Soak fruit and cook rapidly in which it has been soaked.
_____67. Wash fruit, soak a short time, and cook slowly in water in which it has been soaked, adding sugar last.
_____68. Wash fruit, soak, add sugar, and cook rapidly.

XII. Directions: Check (x) the statement which is correct. Check (o) the statement which is incorrect.

If a sauce is desired, the fruit is:

_____ 69. Baked in a covered utensil.

_____ 70. Cooked in a thin syrup.

_____ 71. Cooked in slowly boiling water, in covered utensil.

XIII. Directions: Below are facts and principles which afford a scientific basis for the preparation of fruits and vegetables. In the space below each give one or more practices as indicated by the numbers.

72. Cellulose is softened by alkalines.

73. Cooking in moist heat tends to soften the cellulose.

74. Cellulose is toughened by the addition of sugar.

75. Minerals are very soluble.
1.

2.

76. The longer the cooking period, the greater the loss of minerals in solution.
1.

2.

77. In the presence of heat, and acid chlorophyll decomposes and forms compounds which vary in color from yellow to olive brown.

78. Plant acids are volatile.
1.

2.

79. Carotinoids are insoluble in water at any temperature and are not affected by heat or acids.

80. Lycopin is an isomer of carotene and is insoluble in water at any temperature and not affected by heat or acids.

81. Anthocyanins are very soluble in water - the color is intensified in an acid medium.

82. Flavones are colorless in an acid medium; yellow in an alkaline medium.

83. Esters are easily decomposed by heat.

84. Vitamin A is stable to heat, acids, and alkalis.

85. Vitamin D is stable to ordinary cooking processes.

86. In the presence of alkali, Vitamin B is destroyed at temperatures of boiling water.

87. Vitamin C is stable to acids but is rapidly destroyed in the presence of heat and oxygen.

XIV. Directions: Write in the blank in front of each description the letter or letters corresponding to salad or salads which it best fits.

SALADS

a. Lettuce hearts with French dressing.
b. Mixed greens with French dressing.
c. Carrot and celery curls.
d. Mixed fruit salad with fruit dressing.
e. Molded gelatin salad with mayonnaise.
f. Potato salad with mayonnaise.
g. Meat salad with mayonnaise.
h. Egg and cheese salad with mayonnaise.
i. Tuna fish salad with mayonnaise.
j. Frozen fruit salad.
k. Blushing apple with whipped cream.
l. Tomato and lettuce.
m. Whole spiced cherries and celery curls.

_____ 88,89,90,91,92. Good choices to serve accompanying the main course.

_____ 93,94,95. Contains least amount of nutritive value.

_____ 96,97,98. Supplies a great deal of heat and energy to the body.

_____ 99,100,101,102. Good choice to serve as a main dish.

_____ 103,104,105,106. May be used as dessert.

_____ 107. May be served as a meat substitute.

_____ 108,109. May serve as an appetizer.

XV. Directions: Check (x) statements which are correct. Check (o) statements which are incorrect.

_____ 110. The most economical prunes to buy are 50-60 size.

_____ 111. Seeded raisins are sweeter and of a more pronounced flavor than seedless raisins.

_____ 112. Naval oranges have a thinner, smoother skin than the Valencia.

_____ 113. The Valencia oranges from California are on the market from May to November.

_____ 114. It is best to cut all foods for salads, not break them.

_____ 115. Combine and allow to stand all ingredients combined in Waldorf Salad.

_____ 116. French dressing is best suited to Main dish salads.

_____ 117. Acid in fruits use for salads may cause mayonnaise to separate.

_____ 118. Salads arranged in designs as candle are attractive to serve.

_____ 119. Mayonnaise is a temporary emulsion.

_____ 1120. All ingredients for mayonnaise should be thgroughly chilled.

_____ 121. To obtain the most permanent emulsion in mayonnaise, use fresh egg yolk as an emulsifying agent.

_____ 122. Non-mealy potatoes are best for baking.

_____ 123. Tubers of regular shape and average size give less paring waste.

_____ 124. The Food and Drug Act requires grade-labeling for all canned fruits and vegetables.

_____ 125. Fancy grade of canned fruits is packed in heavy syrup.

_____ 126. The house wife should purchase grade A peas for cream of pea soup.

_____ 127. Grapefruits should be well-shaped and heavy for size.

_____ 128. Pineapple should be heavy in proportion to size.

_____ 129. Berries should not be kept in the refrigerator.

_____ 130. Pineapple should not be kept in a dry atmosphere.

XVI. Directions: Below is given a technical vocabulary used in the study of fruits and vegetables. Define each term briefly in the space below the term.

131. Au gratin-

132. Baked-

133. Blanch-

134. Buttered-

135. Creamed-

136. Enzyme-

137. Escalloped-

138. Ethylene gas-

139. Franconia-

140. Fructose-

141. French fried-

142. Glazed-

143. Julienne-

144. Legumes-

145. Mince-

146. Sauted-

147. Stuffed-

148. Succulent-

TEST L

Objective: To test ability to apply knowledge of facts and principles in new situations - Final Examination.

I. Directions: Below is given a list of processes used in the preparation of foods. On the supply table you will find a number of these foods, all of which are listed in a chart given below.

(1) In column I describe the quality of each food;
(2) In column II place the letter to indicate the cooking process which will give the best product, using this quality;
(3) In column III explain your reason for use of each cooking process;
(4) In column IV state length of cooking period in approximate number of minutes.

A. Quality Terms

a. Generous marbling of fat
b. Some marbling of fat
c. Lacks marbling of fat
d. Fine grain
e. Coarse grain or kind of meat
f. Good color for kind of meat
g. Poor color for kind of meat
h. Clean and sound
i. Dirty and faulty
j. Economical size
k. Less economical size
l. Young and tender
m. Mature and tender
n. Mature and tough
o. Immature
p. Overripe
q. Fresh in appearance
r. Wilted
s. Free from blemish
t. Clean and sound
u. Dirty and cracked
v. Uniform size
w. Whole grains
x. Broken grains
y. Free from dirt, mold, mustiness

B. Cookery Processes

a. Boil rapidly
b. Simmer
c. Cook covered
d. Cook uncovered
e. Start cooking in boiling water
f. Start cooking in cold water
g. Use little water in cooking
h. Use much water in cooking
i. Beat eggs slightly
j. Beat eggs until stiff
k. Roast
l. Broil
m. Bake
n. Sear
o. Steam
p. Braise
q. Cook in double boiler
r. Cook over direct flame
s. Cook in slightly acid medium
t. Cook in slightly alkaline medium
u. Add sugar after product is cooked
v. Add sugar before product is cooked
w. Cook whole
x. Cook in small pieces
y. Add salt after product is cooked
z. Add salt before product is cooked
aa. Stir during cooking
bb. Do not stir during cooking

I	II	III	IV
Food	Quality of Food	Cookery Process	Reason for choice of cookery process	Length of Cooking
1. Prunes	2.	3. ____	9.	15
		4. ____	10.	
		5. ____	11.	
		6. ____	12.	
		7. ____	13.	
		8. ____	14.	
16. Apples	17.	18. ____	25.	32.
		19. ____	26.	
		20. ____	27.	
		21. ____	28.	
		22. ____	29.	
		23. ____	30.	
		24. ____	31.	
33. Beets	34.	35. ____	42.	49.
		36. ____	43.	
		37. ____	44.	
		38. ____	45.	
		39. ____	46.	
		40. ____	47.	
		41. ____	48.	
50. Bleached Cabbage	51.	52. ____	59.	66.
		53. ____	60.	
		54. ____	61.	
		55. ____	62.	
		56. ____	63.	
		57. ____	64.	
		58. ____	65.	
67. Yellow Squash	68.	69. ____	77.	85.
		70. ____	78.	
		71. ____	79.	
		72. ____	80.	
		73. ____	81.	
		74. ____	82.	
		75. ____	83.	
		76. ____	84.	
86. Turnip Greens	87.	88. ____	93.	98.
		89. ____	94.	
		90. ____	95.	
		91. ____	96.	
		92. ____	97.	

Food		Quality of Food	Cookery Process	Reason for choice of cookery process	Length of Cooking
99.	A	100	101. _____ 102. _____	103. 104.	105.
106.	B	107.	108. _____ 109. _____	110. 111.	112.
113.	C	114.	115. _____ 116. _____ 117. _____	118. 119. 120.	121.
122.	D	123.	124. _____ 125. _____ 126. _____ 127. _____ 128. _____	129. 130. 131. 132. 133.	134.
135.	E	136.	137. _____ 138. _____ 139. _____ 140. _____ 141. _____	142. 143. 144. 145. 146.	147.
148.	F	149.	150. _____ 151. _____ 152. _____ 153. _____ 154. _____ 155. _____ 156. _____	157. 158. 159. 160. 161. 162. 163.	164.
165.	Eggs (in custard)	166	167. _____ 168. _____	169. 170.	171.
172.	Chicken	173	174. _____ 175. _____	176. 177.	178.
179.	Oatmeal	180.	181. _____ 182. _____ 183. _____ 184. _____	185. 186. 187. 188.	189.
190.	Rice	191	192. _____ 193. _____ 194. _____ 195. _____ 196. _____ 197. _____	198. 199. 200. 201. 202. 203.	204.

205. Grits 206. 207. _____ 213. 219.
208. _____ 214.
209. _____ 215.
210. _____ 216.
211. _____ 217.
212. _____ 218.

II. Directions: Below are given names of processes commonly used in preparing and cooking foods. Define each in the space below the term.

220. braising-

221. broiling-

222. cream-

223. cut and fold-

224. dredge-

225. glaze-

226. knead-

227. marinate-

228. mince-

229. saute-

230. simmer-

231. stew-

232. whip-

III. Directions: Consider a family who must use an oven to maximum capacity. This family is cooking a 3 lb. pork loin (oven usual size). This family has electric refrigeration. In the table are listed groups of foods all of which may be cooked in the oven.

(1) In column A indicate by a check (x) foods which may be cooked while roast is cooking, and by (o) those foods that cannot be cooked while roast is cooking.

(2) In column B explain why those checked (o) cannon be cooked while roast is cooking.

Food	A	B
1. Angel cake	233	234
2. Apples	235	236
3. Biscuit	237	238
4. Butter Layer cake	239	240
5. Bread Pudding	241	242
6. Carrots	243	244
7. Chocolate Drop cookies	245	246

Food	A	B
8. Custard pie	247	248
8. Deep dish Apple pie	249	250
10. Escalloped Potatoes	251	252
11. Fruit cake	253	254
12. Onions	255	256
13. Pie shell	257	258
14. Rolls	259	260
15. Spoon bread	261	262
16. Sugar cookies	263	264
17. Squash	265	266
18. Sweet Potatoes	267	268

IV. Directions: A. Below is given a recipe for gingerbread. Read proportions and directions carefully.

Recipe for Gingerbread

a. ¼ c melted butter
b. 1 c sour milk
c. 2 tsp. ginger
d. 1 c molasses
e. 1/3 c sugar
f. 1-3/4 tsp. soda
g. ½ tsp. salt
h. 2-1/3 c flour
i. 1 egg
j. 1 tsp. cinnamon

Mix soda with sour milk and add to molasses. Sift together remaining dry ingredients, combine mixtures, add butter and beat vigorously. Pour into a buttered shallow pan, and bake twenty-five minutes in a moderate oven.

B. Criticise proportions of ingredients given in recipe, make changes if necessary to produce a standard product.

_____266. _____270.

C. (Time-winter-all foods are purchased from city market). What substitutions could be made for any ingredient?
(1) Either to reduce cost
(2) For convenience at time of preparation
If substitutions are made give quantity of food substituted.

Ingredients	Substitutions	Quantity
_____271	_____272	_____273
_____274	_____275	_____276
_____277	_____278	_____279

D. List all ingredients which must be measured with extreme accuracy to produce a standard product.

_____ 280 _____ 282
_____ 281 _____ 283

E. List ingredients which may be measured approximately to save time and utensils.

_____ 284. _____ 285
_____ 286 _____ 287

TEST M

Objective: To measure facts and principles - Fats and Oils

I. Directions: Below are given terms used in the study of fats and oils. Define or explain each term in the space below the term.

1. Acrolein
2. Cereal or light cream
3. Compounds
4. Creamery butter
5. Heavy cream
6. Hydrogenated fats
7. Leaf lard
8. Medium cream
9. Margarine
10. Oil
11. Smoking temperature
12. Solid fat
13. Suet
14. Sweet butter

II. Directions: Below is given a list of fats and oils. At the right of this list is given the approximate decompositive temperature of various fats. In the blank at the left of each fat or oil, write the letter which indicates the approximate decompositive temperature of that fat or oil.

_____15. Cotton seed oil
_____16. Corn oil
_____17. Crisco
_____18. Butter fat
_____19. Leaf lard
_____20. Olive oil
_____21. Peanut oil
_____22. Snowdrift

a. 426°F - 450°F
b. 417°F - 430°F
c. 406°F
d. 300°F - 347°F

III. Directions: Below are given types of products: In blank A at the right give the generally accepted frying temperature for each type. In blank B give the time required to brown 1 inch cube of bread in the hot fat.

A	B	
Temperature of fat	Time required to brown in inch cube of bread.	Type of Product
23.	24.	a. doughnuts, croutons, fritters.
25.	26.	b. cold foods, fried potatoes, croquettes

IV. Directions: Below are given facts and principles regarding fats and fat cookery. In the space below each fact make a brief explanation of the fact.

27. Fats used for deep-fat frying should be clarified often.

28. Dip croquettes in egg before frying them.

29. Heat fat for all frying 350°F or above.

30. Use a small diameter utensil for deep-fat frying.

V. Directions: Fat used for deep-fat should be clarified after use and properly stored. In the space below outline steps used in clarifying and storing this fat.

31.

32.

33.

Spacing is reduced in all tests from the original copies.

MINNESOTA CHECK LIST FOR FOOD PREPARATION AND SERVING

University of Minnesota—Division of Home Economics

Devised under the Direction of CLARA M. BROWN by the Faculty and Graduate Students of the Division of Home Economics

Rating of _____ Rated by _____ Date _____ Score _____

	1	2	3	4	5	Score
1. GROOMING	Untidy, hair in disorder; hands and nails dirty; objectionable odors; dress or apron inappropriate, or badly soiled, or in need of mending.		Reasonably well groomed; no objectionable odors; dress suitable; apron clean but in need of pressing.		Immaculately clean; dress or apron appropriate, fresh, and unwrinkled.	1)
2. NEATNESS OF TABLE WHILE WORKING	No space to work; food spilled; table cluttered with dishes and utensils which are not put to soak or washed.		Not very orderly but working space made available when needed; dishes and utensils fairly well cared for as used.		Working space always available; clean and orderly; minimum number of dishes used; dishes and utensils properly cared for.	2)
3. EFFICIENCY IN USE OF TIME AND EFFORT	Wastes time; has no plan, or does work in wrong sequence. Poor methods, or wrong type or size of utensils used; jobs not finished on time.		Takes unnecessary steps, or uses too many utensils. Doubtful about procedure or does not follow plan very well. Rushed toward end of period.		Seldom wastes time; plans carefully and follows plan; uses efficient methods and suitable utensils. Finishes job on time or ahead of schedule.	3)
4. USE OF SUPPLIES	Wastes food by measuring inaccurately, burning, or spilling. Wastes fuel.		Wastes little food or fuel; handles supplies carefully.		Measures accurately; prepares proper quantities; does not waste food or fuel.	4)
5. ABILITY TO FOLLOW DIRECTIONS	Apparently unable to follow directions; asks many questions; makes many mistakes.		Follows directions if they are explicit and stressed; makes few mistakes.		Follows directions carefully and without supervision; does not make mistakes.	5)
6. MANIPULATIVE SKILL	Clumsy and awkward in handling equipment and preparing food; works noisily.		Fairly skillful in handling equipment, but awkward in difficult operations.		Very skillful even in difficult operations.	6)
7. SANITARY HABITS	Uses soiled spoon to taste food or dips finger into food. Handles handkerchief or kitchen linen carelessly.		Rinses spoon between tastings. Washes hands frequently. Seldom handles handkerchief carelessly or misuses kitchen linen.		Uses different spoons for serving and tasting. Never touches food unless hands are clean.	7)
8. SPEED	Works very slowly.		Works with average speed.		Works quickly.	8)
9. CARE OF SUPPLIES AND EQUIPMENT AFTER USE	Has no system; things not washed clean; articles handled carelessly, misplaced, or not put away.		Leaves stove, counter, and sink clean and in reasonably good order; some articles may be misplaced or carelessly handled.		Leaves all the equipment very clean; glassware, china, silver, and utensils shine; everything carefully handled and put in proper place.	9)
10. SETTING OF TABLE	Uses wrong dishes, silver, linen, or decorations; arranges cover incorrectly or inappropriately.		Selects fairly suitable dishes, silver, linen, and decorations; sets table neatly and correctly.		Selects suitable dishes, silver, linen, and decorations; sets table correctly and attractively.	10)
11. SERVING	Awkward; makes many mistakes; serves unsuitable amounts; food messy and poorly arranged.		Somewhat awkward but makes few mistakes; serves correct amounts and arranges food neatly.		Serves correctly and with ease; serves proper amounts and arranges food attractively.	11)
12. MENU	Unbalanced, poor combinations of color, flavor, or texture. Poorly chosen in relation to family, occasion, or season.		Proper foods included; fairly attractive and pleasing combinations, but little originality. Reasonably good for family, occasion, and season.		Well balanced, palatable, attractive, and interesting. Foods well chosen in relation to cost, situation, and season.	12)
13. TABLE MANNERS	Has objectionable habits; eats noisily; handles silver awkwardly.		Eats quietly and unobtrusively; makes occasional error in handling silver.		Has very good table manners; eats quietly and unobtrusively; handles silver expertly.	13)
14. POISE	Ill at ease; worried; has nervous mannerisms; unable to carry on a conversation.		Reasonably self-possessed, upset by unexpected situations; converses fairly well.		Apparently at ease, self-possessed, and gracious; converses easily.	14)
					Total _____	_____
	(To find score, divide by number of points checked.)				Score _____	_____

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(609)

Objectives of the Course in Food Selection and Preparation.

I. Student Knowledge
1. To understand the scientific principles that explain cookery processes.
2. To understand principles of selection as a bases for the wise purchase of food products.
3. To understand basic proportions for common recipes and the bases upon which substitutions can be made.
4. To know how to plan time schedules.
5. To know how to make out market lists.
6. To gain the vocabulary of technical and scientific terms needed to understand the subject matter discussed in lectures and references.
7. To understand principles of nutrition as a basis for selection of foods to include in a daily or weekly dietary.

II. Student Attitudes
1. To develop an interest in food preparation.
2. To develop an interest in the esthetics of foods.
3. To desire to repeat the preparation of products until a satisfactory standard has been reached.
4. To feel responsible for keeping the laboratory in order.

III. Student Habits
1. To develop habits of personal cleanliness.
2. To develop orderliness and cleanliness in food preparation and laboratory work.
3. To measure accurately and economically all food supplies.
4. To plan work so as to save steps and time.
5. To evaluate own products.

IV. Student Skills
1. To be able to prepare common foods so as to obtain palatable and attractive products, and at the same time retain their nutritive values.
2. To be able to select and use methods of preparation and temperatures which will produce desirable products.
3. To be able to plan palatable, attractive, nutritious meals (to evaluate common food products in terms of their nutrition value, color, flavor, texture, form).
4. To be able to choose suitable dishes in which to serve food and to set a cover properly.
5. To be able to use and care for the ordinary utensils and pieces of kitchen equipment.
6. To be able to prepare a simple meal and have everything ready to serve at the same time.

CHECK LIST FOR FOOD NEEDS

Adapted from Diets to Fit the Family Income
Farmers' Bulletin No. 1757

	0	1	2	3	4
EGGS	None		3-4 servings a week		One or more servings daily
MILK (or cheese)	None		1-2 cups (or 1-2 oz.) a day		3-4 cups (or 3-4 oz.) a day
LEAN MEAT, POULTRY OR FISH.	None		3-4 servings a week		One or more servings daily
BUTTER	None		Once a day		At every meal
VEGETABLES Green or Yellow Vegetables	None		One serving a day		Two servings (one raw) daily
Other Vegetables or Dried Beans or Peas	None		3-4 servings a week		At least one serving daily
FRUITS Citrus Fruits or Tomatoes	None		3-4 servings a week		One or more serving daily
Other Fruits	None		3-4 servings a week		One or more servings daily
BREADS AND CEREALS Whole-grain Bread or Breakfast Cereals, or Corn Meal; or fortified Cereal Products	None		One serving daily		Two or more servings daily
MISCELLANEOUS Coffee, Tea, Coca-Cola; or Candy (except at meals)	Two or more daily		One serving daily		None