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To the Graduate Council:

I am submitting herewith a thesis written by Agnes June Reese Majhor entitled "A Comparison of Roasting Turkey by an Open-Pan and a Foil-Wrap Method." I recommend that it be accepted for nine quarter hours of credit in partial fulfillment of the requirements for the degree of Master of Science, with a major in Foods and Institutional Management.

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Major Professor

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A COMPARISON OF ROASTING TURKEY BY AN OPEN-PAN AND A FOIL-WRAP METHOD

A Thesis

Presented to

the Graduate Council of

The University of Tennessee

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

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by

Agnes June Reese Majhor

June 1962

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CHAPTER I

INTRODUCTION

There has been limited research on methods of cooking poultry in recent years. In the same time, vast strides have been made in breeding, feeding, processing, and marketing of poultry. Improvements have brought about increased production at lower cost. These changes, along with better refrigeration have made poultry available the year around. It is reasonable to assume that certain procedures may be better than others in preparing poultry for the table.

A check of several cook books, material from the Poultry and Egg National Board, and other sources indicates that the method most frequently recommended for roasting poultry is: to roast in an open pan at a constant low temperature of 300° to 350° F., using the higher temperature for the smaller birds. For the last ten years a manufacturer of aluminum foil has been recommending roasting turkey wrapped in aluminum foil. The procedure is to wrap the turkey completely in heavy duty foil, to use a 450° F. oven, and to open the foil for the last 15 to 20 minutes of roasting. This method has been claimed to produce a "juicy, tender, truly roasted turkey" in less time (Reynolds Metal Company, 1961). Other advantages claimed for the method are: (1) need for basting is eliminated; (2) a special roasting pan is not needed; and (3) the oven is kept clean due to elimination of spattering of drippings.

This thesis study compares turkey roasted at 450° F. wrapped in aluminum foil with turkey roasted in an open pan at a constant low

temperature of 325° F. Data on palatability, cooking losses, yield of edible meat, heat penetration, cooking time, and fuel consumption were obtained for each method of roasting.

It was hoped that the results of this study would provide reliable information which might serve as a guide for homemakers in selecting a method for cooking turkey.

CHAPTER II

REVIEW OF LITERATURE

Before 1935 very little research had been done on methods of roasting poultry. In recent years several workers have investigated various factors which affect the acceptability of roasted poultry. Some of this work is applicable to turkeys and is reviewed here.

I. COOKING PROCEDURE

Lowe and Keltner (1937) reported on work carried out at Iowa State College to obtain information regarding desirable procedures for roasting poultry. In this study comparison was made of: (1) cooking temperatures, (2) roasting in covered and uncovered pans, (3) roasting uncovered and covered part time, and (4) basting and not basting. Chicken halves were used for these tests. Later tests were conducted with stuffed whole chickens to determine whether methods found most desirable for roasting chicken were applicable to whole stuffed chickens. It was concluded that halves roasted at 250° to 350° F., in an uncovered pan with basting during roasting gave acceptable products. It was also concluded that these procedures were applicable to whole stuffed birds.

Procedures for roasting poultry based on research conducted at the Bureau of Home Economics in the United States Department of Agriculture were published by Alexander in 1941. Alexander recommended roasting poultry in a shallow pan without a cover, blanket of cloth, or dough. The temperature was based on the weight of the bird. An oven temperature

of 325° F. was recommended for 6 to 9 pound turkeys, and the temperature was decreased with increased bird size. For large 24 to 30 pound birds, 250° F. was advised. No hard and fast rule was given for cooking time, as this factor was said to be dependent on the weight of the bird, oven temperature, and other factors, such as sex, breed, and amount of body fat in the bird.

II. OVEN TEMPERATURE

Two oven temperatures, 250° and 350° F., were tested by Lowe and Keltner (1937) for roasting chicken halves. The cooking time was twice as long at 250° F. as at 350° F. Negligible differences were reported in cooking losses and palatability. Breast meat of the halves roasted at the higher temperature was reported to be more moist, probably due to the shorter cooking time.

Lowe, et al. (1953) tested a wide range of temperature for roasting turkey in aluminum foil. Since foil tended to delay heat penetration into the turkey meat, they found that the temperature of the oven was highly important. A temperature of 450° F. was found to be best for roasting foil-wrapped turkey. At 300° to 325° F. the cooking time was too long and the turkey dried out. In order to obtain a browned bird it was recommended that the foil be opened during the last 20 minutes of roasting.

Goertz and Stacy (1960) roasted half and whole turkey hens to determine the effects of varying oven temperature. The birds were roasted to an internal temperature of 194° F. in the breast muscle at oven temperatures of 300°, 325°, and 350° F. Total cooking losses and

cooking time in minutes per pound were similar for turkey halves roasted at 300° and 325° F., and greater than for halves roasted at 350° F. Volatile losses were greatest in the halves cooked at 325° F. and smallest in those cooked at 350° F. For whole birds, the cooking time in minutes per pound was similar for those roasted at 325° and 350° F., and less than for those cooked at 300° F. Volatile losses were greatest in birds cooked at 350° F. and least in those cooked at 325° F. It was concluded that an oven temperature of 325° F. was most acceptable for whole turkeys, and 350° F. for turkey halves, when roasted to an end point of 194° F. internal temperature in the breast muscle.

III. END-POINT OF COOKING

Rule-of-thumb procedures, various end-point temperatures, and other methods have been used to determine when roasted poultry was satisfactorily done. As a rule-of-thumb procedure, Alexander (1941) recommended very careful spearing of the breast and leg muscle with a skewer or fork to determine tenderness and "working" of the leg and wing joints to detect softening of the tendons.

Studies to determine the end-point of roasting were reported by Alexander, et al. (1951). This work was done with fifteen turkeys, representing two varieties, three cross breeds, and age-range from twenty-eight to forty-three weeks. The birds were roasted to different stages of doneness according to procedures recommended by Alexander (1941). Internal temperatures were recorded in the thigh muscle, breast, and stuffing for relating temperature to doneness. It was found that the temperature in

the thigh muscle varied the least, from 194° to 201° F., for satisfactorily cooked turkey. Temperature in the breast muscle ranged from 176° to 203° F., and in stuffing from 176° to 201° F. In general the smaller birds required the higher temperature in both the thigh and breast muscles. The author felt that the results of this study could not justify recommendations of a specific end-point temperature as the best means of determining when a turkey is properly done throughout.

Lowe (1955) points out the disadvantages of using the internal temperature of the stuffing as an indication of doneness. Since moist and dry stuffing conduct heat at a different rate, stuffing temperature cannot be used as an indicator of muscle temperature. The temperature of the stuffing may range from 158° to 185° F. when the muscles are sufficiently cooked.

Over a period of two years Goertz, et al. (1960) investigated certain end-point temperatures in breast and thigh muscles to determine which would produce most consistently an optimumly done bird. They concluded that turkey halves roasted to either 194° F. in the breast muscle or 203° F. in the thigh muscle were satisfactorily done. An end-point of 194° F. in the breast muscle was preferred because of the size and uniformity of the breast muscle compared to the thigh muscle. Turkey halves cooked to only 185° F. in the thigh muscle were underdone. Flavor and tenderness scores were similar for birds cooked to all end-point temperatures. Juiciness score and press fluid yield were lower and cooking losses higher for the satisfactorily done birds.

The National Turkey Federation (1947) and the Poultry and Egg National Board (1954) suggested placing the thermometer so that the bulb rested in the center of the inside thigh muscle adjoining the body cavity. A final internal temperature of 190° to 195° F. was recommended as the end-point temperature.

IV. YIELD OF EDIBLE MEAT

Several surveys on the yield of edible cooked meat from turkey have been reported. There has been some research also on edible yield and factors affecting it. The National Turkey Federation (1947) reported on surveys carried out in school lunchrooms, hospitals, hotels, and other institutions involved in quantity cookery. It was concluded from these surveys that the yield of meat after cooking was less related to the method of cooking than to the dressed raw weight of the bird; the heavier the dressed raw weight, the greater the yield of edible meat.

A limited study on the yield of edible meat from turkeys was reported by Knapp (1958). In this study eight broad-breasted type turkeys were used. The yield of cooked boned meat averaged 35.4 to 38.0 per cent of the raw New York dressed weight of birds averaging 23.5 to 24 pounds.

Alexander, et al. (1948) reported on work carried out to determine the yield of edible meat from turkeys of different sizes and shapes. This work was done on thirty-three turkeys of roasting age, graded for breast type and leg fleshing. They were cooked by methods recommended

for the home kitchen. In this group, eleven Beltsville Small White turkeys (eight male and three female) and twenty-two Broad Breasted Bronze turkeys (sixteen male and six female) were used. The average weight of the Beltsville males was 13 pounds and of the Broad Breasted Bronze 25 pounds. The average weight of the Beltsville females was 7 pounds and of the Broad Breasted Bronze 13 pounds. They were roasted until tender in open shallow pans at 250° F. for the larger birds and 325° F. for the smaller ones. The yield of edible meat, based on the raw dressed weight, was greater for the smaller birds than for the larger birds. The Beltsville Small White females averaged 53 per cent yield of edible meat. Yield from the other groups was 47 to 48 per cent. The authors point out that the need for adapting cooking methods to grade and weight is apparent in order to obtain the greatest per cent yield of edible meat.

Dawson, et al. (1958) reported a study on the yield of edible meat from turkeys of various weights, cooked by roasting and steaming. Ready-to-cook turkeys without neck and giblets gave approximately the same yield of edible meat whether roasted or steamed. The average yield from light, medium, and heavy Beltsville White tom turkeys ranged from 38 to 42 per cent of the ready-to-cook weight or 31 to 33 per cent of the New York dressed weight.

V. COOKING TIME

The total cooking time for turkeys cannot be determined to the minute due to many factors, such as: age, sex, body fat, variety, and

breed. However, some investigators have compiled tables, based on weight of the turkey and temperature of the oven, to serve as a guide in estimating approximate cooking time (Alexander 1941, Lowe 1943, 1951). A seemingly naive method suggested by Niles (1936) to determine the cooking time for a turkey was to simmer the gizzard in unsalted water until tender; this time plus one hour for heating the bird was said to give a fair estimation of the time required for cooking that particular bird.

VI. COOKING IN FOIL

Only one study was found in which poultry cooked in aluminum foil was compared with the so-called conventional method of roasting. Lowe, et al. (1953) compared the two methods for cooking poultry. The unwrapped turkeys were cooked according to recommendations of the Poultry and Egg National Board, at 300° to 325° F. The turkeys cooked in foil were wrapped tightly in foil and cooked at 450° F. The foil was turned back about 20 minutes before the end of the roasting period to allow for browning and to let the pent-up steamy odor escape, thus improving the appearance and aroma of the turkey. The advantages that were found for the foil-wrapped method of cooking were: (1) dripping and spattering were prevented; (2) no special rack or equipment was needed; (3) higher temperatures could be used, thus shortening the cooking time; and (4) less moisture was lost, so that more drippings were saved for making gravy. The disadvantages noted were: (1) a good browned appearance was not obtained, particularly along the back; (2) muscles tended to pull away from the bone; and (3) more fuel was required because of the high temperature used.

CHAPTER III

PROCEDURE

In this study two methods or roasting turkey were compared. Turkey roasted at a constant low temperature of 325° F. in an open pan was compared with turkey wrapped in aluminum foil and roasted at 450° F. Seven broad-breasted type turkeys were tested in this study. For each test the birds were halved lengthwise, and the two halves of a single turkey were cooked on the same day, one-half by each method, making seven replications of each test.

Thawing was the first step in preparation for cooking. The halves were wrapped in aluminum foil and allowed to thaw in a household refrigerator until time of preparation for roasting. Halves, after removal of neck, giblets and excess fat, ranged in weight from 4.4 to 5.7 pounds.

Upon removal from the refrigerator, each half was washed thoroughly under running water, patted dry with paper towels, and pinfeathers removed. Metal skewers were inserted at the thickest part of the breast muscle in each half for later placement of thermocouples. Each half was brushed with one-eighth pound melted margarine and weighed on a torsion balance. This weight was recorded as the raw weight.

The half which was to be roasted by the open-pan method was placed in a tared shallow pan containing a rack. The metal skewer was replaced by a copper and constantan thermocouple.

The turkey half which was to be roasted in aluminum foil was placed in a similar pan, without a rack, but with enough aluminum foil to wrap the half-bird. The pan and aluminum foil had been weighed previously and the weight recorded. The thermocouple was inserted into the breast muscle as for the open-pan method. The half-birds were held at room temperature until the internal temperature of the breast muscle was 50° to 60° F. as measured on a Leeds-Northrup potentiometer.

I. COOKING PROCEDURES

The cooking procedure followed for the open-pan method of roasting was that recommended by the Poultry and Egg National Board (1961), with the exception that cooking was started in a cold oven. The cooking procedure for the foil-wrapped method was that recommended by the Reynolds Metal Company (1961), with the exception that the turkey half was started in a cold rather than a preheated oven. Cold ovens were used in order to obtain a record of total fuel consumption for each method.

The ovens of two household electric ranges were used for roasting the turkey halves. The ovens were alternated for the two methods of roasting to equalize the effect of any thermostat variation in the two ovens.

The turkey halves were placed in the ovens when the internal temperature of the breast muscle was between 50° and 60° F. A wattmeter was attached to the power line of each oven and the initial reading

and time were recorded. The oven thermostat for the open-pan method was set at 325° F., and that for the foil-wrapped method was set at 450° F. Roasting of the two halves was started simultaneously. Internal temperature readings were made every three minutes on the potentiometer to have a record of heat penetration. When the internal temperature of the foil-wrapped bird reached 180° F. the foil was turned back to allow for browning. To make a comparable effect on fuel consumption the door of the 325° F. oven was opened once during roasting. For both methods, roasting was continued until the internal temperature of the breast muscle reached 194° F. They were removed from the oven at this point and allowed to cool for 30 minutes.

II. DETERMINATION OF COOKING LOSSES, EDIBLE YIELD, AND FUEL CONSUMPTION

The weight loss by evaporation was determined by subtracting the final weight of pan, rack or foil, and turkey half from the initial weight of pan, rack or foil, and raw weight of the turkey half. The roasted half was then removed from the pan, and the weight loss due to drippings was determined by weighing pan, with rack or foil, and drippings and subtracting the weight of the pan and rack or foil.

In order to determine the yield of edible meat for each method of cooking, all meat was removed from the bones. It was separated into light meat and dark meat, excluding skin.

Final cooking time and wattmeter readings were recorded upon removal of turkey halves from the oven. The cooking time per pound, total watts consumed, and watt comsumption per pound were calculated.

III. SENSORY TESTING

Two sensory tests were employed to measure acceptability, a scoring test and a preference test.

The sensory testing was done by a panel of four men and two women. No member of the panel was trained for organoleptic work with poultry; however, two were experienced in judging beef. The panel was trained in two practice sessions. In the first practice roasted chickens were used to familiarize the panel members with the scoring and preference tests that were to be used. The second practice simulated real test conditions, and turkey roasted by the two methods was used.

For the scoring test each panel member was given a portion of light and dark meat carved from corresponding locations of the breast and thigh muscle of each turkey half. The samples were coded so the judges were not aware of which cooking procedure had been used. The meat was scored for juiciness, flavor, and tenderness, using the following nine-point scale:

9 Excellent
8 Very Good
7 Good
6 Fair Plus
5 Fair
4 Fair Minus
3 Poor
2 Very Poor
1 Extremely Poor

In addition to the sensory scoring, each panel member was given a paired sample of light meat representing the two methods of cooking

and asked to state a preference between the two and give a reason for the selection. The preference test was repeated with paired samples of dark meat.

CHAPTER IV

RESULTS AND DISCUSSION

I. COOKING TIME AND FUEL CONSUMPTION

The cooking time and fuel consumption for seven different cookings and the averages for each method are shown in Table I. The average cooking time for the open-pan method was 24.7 minutes per pound and for the foil-wrapped method 19.4 minutes per pound. The total cooking time based on the average raw weight of the turkey halves was reduced about 25 per cent for the foil-wrapped method, and the time per pound was reduced about 21 per cent.

Fuel consumption averaged 366 watts per pound for turkey halves roasted by the open-pan method, and 471 watts per pound for the foil-wrapped halves. This is an increase of about one-tenth kilowatt per pound (29 per cent) for the foil-wrapped method and a total wattage increase of about 23 per cent.

II. COOKING LOSSES

Data on losses due to evaporation and drippings, as well as total cooking losses, are shown in Table II. There were no important differences in the average weight loss due to evaporation or drippings. Therefore, there were negligible differences in the average total cocking losses with these two methods of cooking. It should be noted that there was considerably more variation within each cooking method than between

TABLE I

COOKING TIME AND FUEL CONSUMPTION FOR
ROASTING TURKEY BY TWO METHODS

Cooking Number	Raw Weight		Cooking Time				Fuel Consumption			
	Open Pan	Foil Wrapped	Open Pan		Foil Wrapped		Open Pan		Foil Wrapped	
	lb.	lb.	Total Min.	Min./lb.	Total Min.	Min./lb.	Total Watts	Watts/lb.	Total Watts	Watts/lb.
I	4.5	4.4	123	27.0	105	24.0	1799	400	2468	561
II	5.5	5.1	119	21.6	95	18.6	1830	333	2314	454
III	5.6	5.1	146	26.0	104	20.4	2056	367	2598	509
IV	4.9	5.0	127	26.0	94	19.0	1951	398	2311	462
V	5.6	5.3	135	24.1	96	18.1	2010	359	2371	447
VI	5.7	5.0	131	23.0	93	19.0	1950	342	2170	434
VII	5.0	5.4	126	25.2	93	17.0	1822	364	2329	431
Average	5.3	5.0	130	24.7	97	19.4	1917	366	2366	471

TABLE II

PERCENTAGE COOKING LOSSES OF TURKEY
ROASTED BY TWO METHODS

Cooking Number	Evaporation Loss		Drippings Loss		Total Cooking Losses	
	Open Pan	Foil Wrapped	Open Pan	Foil Wrapped	Open Pan	Foil Wrapped
I	21.4	25.2	4.8	4.5	26.2	29.7
II	15.9	17.2	10.3	9.1	26.2	26.3
III	20.7	26.7	12.0	8.8	32.7	35.5
IV	19.0	21.5	9.4	10.9	28.4	32.4
V	20.2	16.2	9.2	12.8	29.4	29.0
VI	21.3	17.4	10.4	11.8	31.7	29.2
VII	19.6	16.8	6.4	10.0	26.0	26.8
Average	19.7	20.1	8.9	9.7	28.6	29.8

the two methods of cooking. Since the backbone was not always divided equally between the two halves, and since bone does not change weight during cooking, individual raw weights for paired halves varied slightly. This factor probably contributed to the large variations in cooking losses with each method. Variation in size of birds was probably another factor contributing to variation in cooking losses.

III. YIELD OF EDIBLE MEAT

Data for the yield of edible meat from the two methods of roasting are shown in Table III. There was little or no difference in the yield of edible meat from corresponding halves of turkey roasted by either the open-pan or the foil-wrapped method. Both of the methods yielded about 25 per cent light meat, 21 per cent dark meat, or about 46 per cent total edible meat. This is in fair agreement with the yield obtained by Alexander (1948) for broad-breasted birds, and slightly greater than the yield obtained by Dawson, et al. (1958), when yield was based on ready-to-cook weight. Again, it should be noted that there was more variation from bird to bird than between the cooking methods. This may be due to failure to divide the birds exactly in half as explained previously. In most cases the half which weighed the least, and presumably had a lower percentage of bone, produced the higher yield of meat.

IV. SENSORY TESTS

The sensory scores for the light and dark meat cooked by the two methods are shown in Table IV. Each value is the average score for

TABLE III

PERCENTAGE YIELD OF EDIBLE MEAT FROM
TURKEY ROASTED BY TWO METHODS

Cooking Number	Raw Weight in Lb.		Light Meat		Dark Meat		Total Edible Meat	
	Open Pan	Foil Wrapped	Open Pan	Foil Wrapped	Open Pan	Foil Wrapped	Open Pan	Foil Wrapped
I	4.5	4.4	27.8	25.7	21.2	21.1	49.0	46.8
II	5.5	5.1	26.9	25.4	21.7	24.2	48.6	49.6
III	5.6	5.1	22.0	24.0	19.6	20.1	41.6	44.0
IV	4.9	5.0	26.1	22.6	21.1	20.4	47.2	43.0
V	5.6	5.3	22.9	26.0	21.8	21.7	44.7	47.7
VI	5.7	5.0	24.2	28.2	20.4	21.2	44.6	49.4
VII	5.0	5.4	27.8	24.7	23.0	21.7	50.8	46.4
Average	5.3	5.0	25.4	25.2	21.2	21.5	46.6	46.7

TABLE IV

PANEL SCORE FOR LIGHT AND DARK MEAT OF
TURKEY ROASTED BY TWO METHODS

Cooking Number	Flavor				Juiciness				Tenderness			
	Light Meat		Dark Meat		Light Meat		Dark Meat		Light Meat		Dark Meat	
	Open Pan	Foil Wrapped	Open Pan	Foil Wrapped	Open Pan	Foil Wrapped	Open Pan	Foil Wrapped	Open Pan	Foil Wrapped	Open Pan	Foil Wrapped
I	7.8	7.8	8.2	8.0	6.7	6.5	7.7	7.3	8.5	8.2	7.7	6.8
II	7.8	7.8	7.5	7.0	7.7	6.3	7.5	7.2	8.3	8.3	7.7	7.0
III	7.7	7.8	7.7	7.5	7.5	6.7	7.2	7.2	7.8	8.0	6.7	5.8
IV	7.5	7.5	8.0	7.7	7.3	6.5	8.0	7.7	8.0	7.0	8.2	7.2
V	7.3	7.7	7.2	7.3	7.2	6.3	7.2	7.3	8.0	7.8	7.0	6.8
VI	7.5	7.2	7.7	7.2	7.3	6.5	7.5	6.5	8.0	7.7	7.5	6.8
VII	7.6	7.6	7.4	7.4	6.2	6.8	7.4	7.4	8.0	7.8	7.0	7.0
Average	7.6	7.6	7.7	7.4	7.1	6.5	7.5	7.2	8.0	7.8	7.4	6.8

six panel members. The sensory scores indicate no important differences in flavor from corresponding turkey halves cooked by either method. However, the light meat of the halves cooked by the foil-wrapped method was scored, on the average, slightly lower in juiciness, and the dark meat slightly lower in tenderness. All the meat was scored good to very good in flavor and tenderness. In some cases, the light meat of the foil-wrapped halves was scored only fair for juiciness.

For the preference test, each panel member was presented paired samples of light meat and paired samples of dark meat representing the two methods of cooking. It was found that there was a decided preference for both light and dark meat of turkey roasted by the open-pan method. Light meat was preferred 71 per cent of the time and dark meat 74 per cent of the time for forty-two samples. Both light and dark meat from the foil-wrapped method were preferred only 17 per cent of the time. In the remaining cases, there was no preference between the methods. Juiciness and tenderness were indicated most frequently as the basis for preference. There was no indication of enough difference in the flavor of the turkey cooked by the two methods to affect the choice.

V. HEAT PENETRATION

The internal temperature of the center of the breast muscle of the turkey halves cooked by each method was recorded every 3 minutes for four of the seven cookings. Heat penetration curves (Figure 1) were plotted from the averages of these internal temperature readings. A fairly steady rise occurred in the internal temperature of the turkey

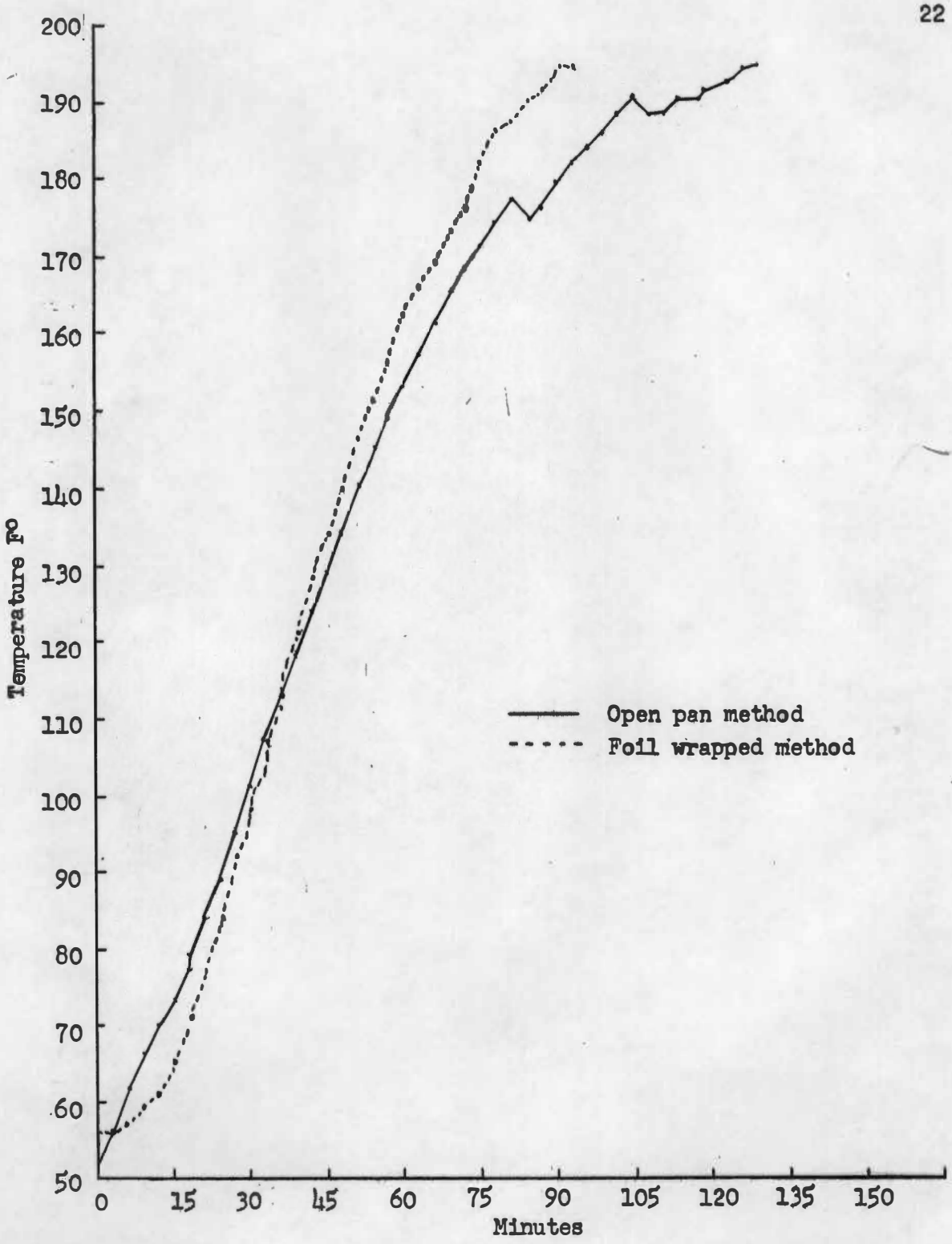


FIGURE 1

HEAT PENETRATION IN TURKEY HALVES
ROASTED BY TWO METHODS

halves cooked by the open-pan method. In the foil-wrapped halves, the temperature rise was slower for the first 15 minutes of cooking. This was followed by a fairly steady rapid rise for the remainder of the cooking period, so that the cooking time for the foil-wrapped halves was about 25 per cent shorter.

VI. EXTERNAL APPEARANCE

Although no record was made of the external appearance of the turkey halves roasted by the two methods, the writer did observe this factor at the end of each roasting period. The skin of each turkey half was well browned and attractive in appearance, regardless of the method of cooking. There was no greyness or steamed appearance in the halves roasted by the foil-wrapped method.

VII. DISCUSSION

The data obtained in this study are limited to seven tests of roasting broad-breasted turkey halves by two methods. Since the data were obtained on half-birds, it cannot be assumed that the conclusions are equally applicable to roasting whole turkeys. Difficulty of dividing each bird into halves of equal weight probably accounted for some of the variations obtained with each method. The panel used for the sensory tests was limited in training and experience. Because of these limitations, results of the study should be considered indicative rather than conclusive.

In general it was determined by scoring tests that both methods produced highly acceptable products which were approximately equivalent

from the standpoint of appearance and flavor. Light meat from the open-pan method was scored slightly more juicy and the dark meat slightly more tender. In preference tests, both light and dark meat from the halves roasted by the open-pan method were highly preferred. Cooking losses and yield of edible meat were practically identical for each method of roasting.

The only real differences observed between the two methods were in cooking time and fuel consumption. When the birds were roasted at 450° F. in a foil wrap, total fuel consumption was increased about 23 per cent, and total cooking time was reduced about 25 per cent.

In view of these findings, it appears that a choice between the two methods of roasting turkey would be a matter of personal decision as to the relative importance of the differences observed.

CHAPTER V

SUMMARY

I. SCOPE OF STUDY

The purpose of this study was to compare the effects of roasting turkey by the so-called conventional open-pan method at 325° F., with a newer aluminum foil-wrap method at 450° F. For the study, seven frozen broad-breasted turkeys, obtained from a local wholesale distributor, were roasted as halves, one-half by each method for each test. The tests were conducted in the fall of 1961.

For each method, data were collected on fuel consumption, cooking time, cooking losses, yield of edible meat, and rate of heat penetration. Sensory tests were used to score the palatability of the light and dark meat of turkey halves cooked by each method and to estimate consumer preferance between the methods.

II. PRINCIPAL FINDINGS

It was found that both methods produced acceptable products, approximately equivalent from the standpoint of appearance and flavor. Light meat from the open-pan method was scored slightly more juicy and the dark meat slightly more tender. In preference tests, both light and dark meat from halves roasted by the open-pan method were highly preferred. Cooking losses and yield of edible meat were practically identical for each method.

The only real differences observed between the two methods were in cooking time and fuel consumption. When the turkey was roasted at 450° F. in a foil wrap, total fuel consumption was increased about 23 per cent (approximately one-tenth kilowatt per pound), and total cooking time was reduced about 25 per cent.

III. CONCLUSION

There was no clear-cut indication that either method of roasting produced superior products, although there seemed to be a decided preference for light and dark meat roasted by the open-pan method. In view of these findings, it appears that a choice between the two methods of roasting turkey would be a matter of personal decision as to the relative importance of the differences observed.

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