W H I T E F I S H A U T H O R I T Y

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Technical Report 131

Storage Acceptability Trial of Pacific Oyster products

February 1976

WHITE FISH AUTHORITY

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I N D E X

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SUMMARY

As part of its programme for gauging the likely acceptance of the Pacific oyster on a large scale, and thereby encouraging British growers to purchase the new seed which was becoming available from commercial hatcheries in the early 1970's, the White Fish Authority developed a number of frozen Pacific oyster products designed for the convenience foods sector of the catering industry.

To ensure that these products were suitable for commercial usage and would therefore tolerate reasonable periods in cold store, a storage acceptability trial was set up at the Catering Research Unit of Leeds University.

Samples from the different product ranges were stored at -30°C (-20°F) and examined by a taste panel at approximately monthly intervals. The taste panel assessments were subjected to a simple statistical analysis by computer which illustrated the overriding trends in the storage characteristics of each product.

By the end of the fifteen month trial, only one of the products - oyster stew - had been deemed unacceptable by the members of the taste panel. The other products remained well within the levels of acceptability throughout the trial period, which is longer than that normally required for prepared products in a commercial environment. No further work is considered necessary.

1. Introduction

Following the successful development of the technique for rearing the Pacific oyster, Crassostrea gigas, on a large scale at the White Fish Authority's Mollusc Unit originally based at Conwy in North Wales (Ref.1), it was thought necessary to create a large scale consumer market for this type of oyster in order to encourage British growers to purchase the new seed in quantity. Therefore in 1971, the Authority's Market Development Unit embarked on a programme to examine the development and marketing of frozen Pacific oyster products aimed specifically at the convenience foods sector of the catering trade.

Most of the product development work was carried out under the Authority's direction at the Catering Research Unit of Leeds University (Ref.2) where the cook/freeze system for institutional catering was largely pioneered. The products developed included:-

Breaded oysters

Oysters in a stout flavoured batter

Oyster dishes in the half shell where the oyster served in the bottom shell was topped with a sauce -

- Mornay (Cheddar/Gruyere cheese sauce)
- Florentine (oysters on a bed of spinach and topped with a cheese sauce)
- Provencale (mixture of tomatoes, onion, pepper and spices)
- Rockefeller (spinach flavoured with Pernod)

Flans - a range including oyster mornay, oyster Florentine, oyster with bacon.

Pies - a range including steak, kidney and oyster, oyster and chicken, oyster with mushroom.

Vol-au-vents - a range of fillings including oyster and shrimp, oyster with mushroom, oysters in a flavoured white sauce.

It was decided to test one representative product from each category, namely:-

Breaded oysters
Oysters in a stout flavoured batter
Oyster provencale in the half shell
Oyster mornay flan
Steak, kidney and oyster pie
Oyster with mushroom vol-au-vent
Oyster stew

These products were chosen on the basis that (a) they were either the only product in a particular category, (b) the sauce used was also used in other categories, (c) the product was the most popular in its category.

The products, prepared according to the specifications detailed in the White Fish Authority's Report (Ref.2), and given in shortened form in Appendix 1, were stored over a period of fifteen months in a walk-in cold store running at an average temperature of -30°C (-20°F) (Appendix 2). Samples were withdrawn at approximately monthly intervals for tasting.

2. Preparation of the Products for Assessment

Standard cooking procedures were adopted for each product in order to eliminate as far as possible changes in flavour and texture not caused by the effects of cold storage.

The cooking procedures were as follows:-

Deep fried in oil

Breaded oysters	2-3 minutes at 175°C (350°F)
Oysters in stout flavoured batter	2-3 minutes at 175°C (350°F)

Re-heated in conventional gas oven

Oyster provencale in the half shell	20 minutes at 205°C (400°F)
Oyster mornay flan	55 minutes at 190°C (375°F)
Steak, kidney and oyster pie	55 minutes at 220°C (425°F)
Oyster with mushroom vol-au-vent	20-25 minutes at 205°C (400°F)

Boil-in-bag

Oyster stew immersed in boiling water for 30 minutes.

3. Assessment of the Products

3.1 Taste Panel

The small taste panel used to examine the products consisted of four to ten assessors - an average of eight assessors per session - drawn mainly from members of Catering Research Unit staff, most of whom had been involved to a certain extent in the evaluation of the various products during the development programme. Although not trained assessors, the majority of the panel members were experienced in detecting rancidity, off-flavours and other deterioration side effects and were therefore more sensitive to slight changes of this type than the average consumer. However, as it was not feasible to prepare control samples of the products for each tasting session, assessors who had not previously tasted the products, and whose opinions were more akin to those of the average consumer, were brought on to the panel at different times during the trial to check that familiarity was not affecting the judgement of the more regular assessors. Each assessment was divided into two parts, the first of which took place during the morning and the second during the afternoon of the same day. In the morning, oysters in stout flavoured batter, steak, kidney and oyster pie, oyster with mushroom vol-au-vent and oyster stew were tasted, with the remaining products tasted in the afternoon. It was not always possible for assessors to be present at both parts of the session and consequently only one panel member assessed all seven product samples on each occasion that he participated.

In all, twenty two assessors participated in the various tasting sessions, but no single assessor was present at every session.

The products were assessed at the following time intervals:-

Interval of storage (weeks)	No. of assessors
0	7
5	9
9	10
13	8
17	10
21	10
25	8
29	5
33	10
39	4
43	7
48	6
64	7

3.2 Product Questionnaires

Each member of the taste panel was required to complete a questionnaire for every product sample that he or she assessed. (Copies of the questionnaires are included at Appendix 3.) Product attributes such as colour, odour, flavour, texture and amount of dehydration were rated on a 5 - point hedonic scale and additional comments were added if deemed necessary.

4. Results of the Trial

It had originally been intended to simply determine the general trends in the changes which occurred in the products during the months in cold store. However, with so much data from the trial, it was decided to carry out a computer analysis (Ref. 3) in order to extract all possible points of interest and accordingly the acceptability ratings from the taste panel questionnaires were converted into scores of 1 - 5 for the computer.

4.1 Analysis of Variance

It was not possible to carry out a complete analysis because only five of the attributes were common to all seven dishes (i.e. defined in identical form).
These were:-

Colour, overall
Odour
Flavour, rancid
Flavour, off
Texture, overall

Further selections were made from the data to obtain a balanced set of figures covering assessor/time combinations when all seven dishes were examined.

An analysis of variance (Table 4) showed that in this limited data, differences in average scores existed - at the 99% confidence level - between assessors, dates and attributes. It further showed strong interactions between assessors and products, dates and products and attributes and products. (This means, for instance, that an assessor responds differently to different products when making a similar assessment.)

4.2 Further Analysis

The results of the analysis of variance on a sample of the data suggested that further investigation should be cautious. For instance, a change in average score over a particular interval could as easily be caused by a random change in the taste panel as by any other factor. It was decided simply to examine the behaviour of the scores with time and report on any apparent trends or points of interest.

Mean scores were calculated and grouped in various ways; the most successful analysis looked at the progress with time of mean scores for each product/attribute combination. All of these time series were plotted, but the array of graphs is too confusing to be reproduced in full. Instead, the graphs were examined and split into four categories:-

1. No apparent trend
2. Downward trend
3. Sudden decline
4. Dip, followed by recovery

These are illustrated in Figures 2 - 5.

Table 5 gives a grouping of all the product/attribute combinations into the four categories.

Table 6 gives the mean scores and standard deviation of all the factors for each product.

5. Discussion

There are several notable points of interest arising from the analyses summarised in Table 5:-

(a) None of the colour scores showed any evidence of deterioration with time.

(b) All of the attributes of oyster stew, except colour, showed a sudden decline in score after nine months. (This was the only product which exhibited this breakdown and the only product to be deemed unacceptable by the taste panel at the end of the trial.)

(c) Most of the attributes of oysters in stout flavoured batter showed a dip in score from the start of the trial, reaching a minimum after about four months but recovering during a similar period.

(d) All the products, except for breaded oysters, exhibited a certain degree of dehydration during the trial period, particularly the vol-au-vents, although still remaining acceptable to the panel.

6. Conclusion

Of the seven products assessed during the trial, only the oyster stew became completely unacceptable to the members of the taste panel: this was due to the sauce separating after nine months in cold store. The other products remained well within the levels of acceptability throughout the fifteen month period, which is longer than that normally required for prepared products in a commercial environment.

7. Recommendation

As the seven products assessed were all acceptable after nine months in cold storage at -30°C (-20°F), and six were still acceptable after fifteen months, it is recommended that as far as keeping quality is concerned, no further recipe development work is required.

8. References

1. Knowles J.T.C. Fish Ind. Rev. 2:1, 1972, 6-8.

2. W.F.A. Technical Report No. 104 - Specifications for the Freezing and Packaging of Oyster Meats and Oyster Products.

3. W.F.A. Field Report No.363 - Analysis of Data from W.F.A. Oyster Product Cold Storage Trials.

TABLE 1

Variation in number of sessions per assessor

No. of sessions	No. of assessors taking part
1	6
2	4
3	3
4	2
5	0
6	1
7	1
8	0
9	0
10	1
11	2
12	1
13	1

TABLE 2

Variation in number of questionnaires per assessor

No. of products assessed by a single assessor	No. of occasions
1	0
2	2
3	9
4	21
5	3
6	7
7	59

TABLE 3

Variation of number of assessors for each product

No. of assessor	No. of times						
	D1	D2	D3	D4	D5	D6	D7
1							
2							
3	1					1	1
4	2	1	1	1	1	1	1
5	4	2				3	5
6	1	5	5	5	6	2	2
7	1	2	4	4	3	4	2
8	2	2	2	2	2	1	2
9	1					1	1
10		1	1	1	1		

TABLE 4: Analysis of variance

List of factors:-

A = two groups of assessors ("expert" v "non-expert")
B = assessors
C = dates
D = products
E = attributes

Factor	Sum of Squares	Deg. of Freedom	Mean Square	
A	0.914	1	0.91	
B	12.857	1	12.85	*
C	28.282	7	4.04	*
D	6.893	6	1.15	
E	98.102	4	24.52	*
AB	0.032	1	0.03	
AC	8.371	7	1.19	*
AD	7.136	6	1.19	*
AE	1.505	4	0.38	
BC	1.571	7	0.22	
BD	13.743	6	2.29	*
BE	2.205	4	0.55	
CD	28.593	42	0.68	*
CE	13.441	28	0.48	
DE	16.348	24	0.68	*
Residual	358.975	971	0.37	
Total	590.968	1119	0.53	

Items marked * are significant at the 1% level.

TABLE 5: Grouping of sttribute/product combination by behaviour with time of mean score.

	1 No Trend	2 Down Trend	3 Sudden Decline	4 Dip/recovery
Colour overall	1234567			
" meat	124567			
Odour	3467		5	12
Flavour rancid	3	146	57	2
" off	3	46	57	12
Texture overall	467	13	5	2
" meat	147		5	
Dehydration	2	467	13	
Sauce separation	14	37	5	

Digits in the table represent the seven products:-

1. Oyster provencale in the half shell
2. Oysters in stout flavoured batter
3. Oyster with mushroom vol-au-vent
4. Steak, kidney and oyster pie
5. Oyster stew
6. Breaded oysters
7. Oyster mornay flan

TABLE 6.

Average scores (with S.D.)

Attribute	Product 1	2	3	4	5	6	7
Colour overall	3.97 (.50)	3.57 (.85)	3.93 (.63)	4.04 (.39)	3.87 (.40)	4.08 .59)	3.83 .47)
Colour of meat	3.97 (.33)	3.84 (.57)	- -	3.88 (.42)	3.89 (.44)	4.03 (.39)	3.90 (.38)
Odour	3.49 (.89)	3.64 (.73)	3.84 (.63)	3.99 (.61)	3.61 (.72)	3.95 (.64)	3.99 (.55)
Flavour rancid	4.46 (.63)	4.31 (.81)	4.73 (.56)	4.52 (.72)	4.17 (.98)	4.52 (.66)	4.38 (.81)
Flavour off	4.46 (.80)	4.40 (.77)	4.78 (.51)	4.54 (.69)	4.27 (.97)	4.49 (.66)	4.35 (.85)
Texture overall	3.64 (.68)	3.82 (.65)	3.98 (.67)	4.01 (0.38)	3.64 (.68)	4.03 (.53)	3.70 (.56)
Texture of meat	3.65 (.56)	- -	- -	3.84 (.62)	3.67 (.64)	- -	3.86 (.51)
Dehydration	4.47 (.77)	4.65 (.63)	4.04 (1.07)	4.48 (.78)	- -	4.63 (.54)	4.32 (.82)
Sauce separation	3.99 (.96)	- -	4.57 (.64)	4.39 (.65)	3.57 (1.00)	- -	4.32 (.62)
Nos. in Sample	72	88	90	90	89	79	77

FIG. 1 EXAMPLE OF A SCORE SHOWING NO TREND DURING THE TRIAL
(STEAK, KIDNEY AND OYSTER PIE: TEXTURE OVERALL)

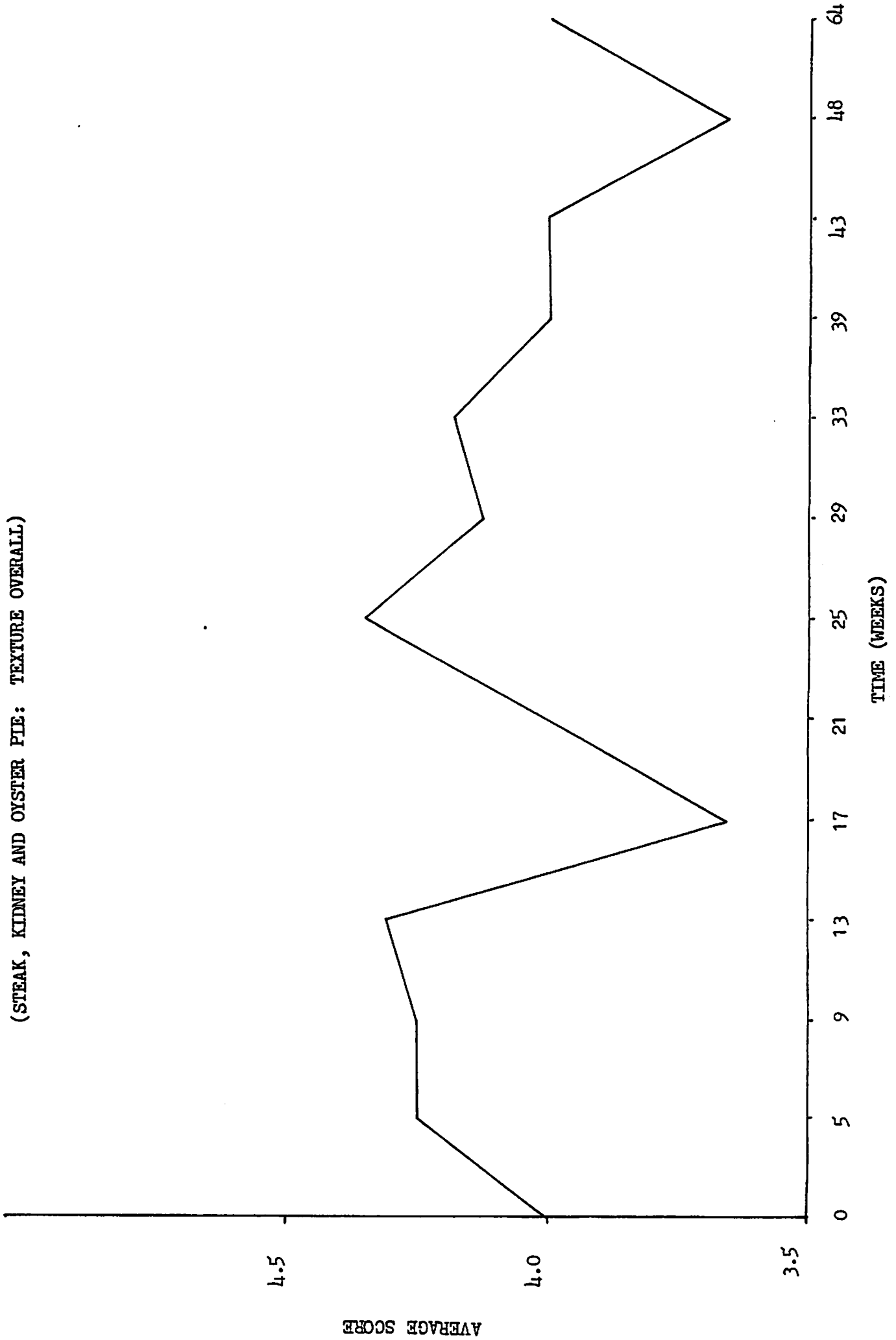


FIG. 2 EXAMPLE OF A DOWNWARD TREND DURING THE TRIAL (BREADED OYSTERS : DEHYDRATION)

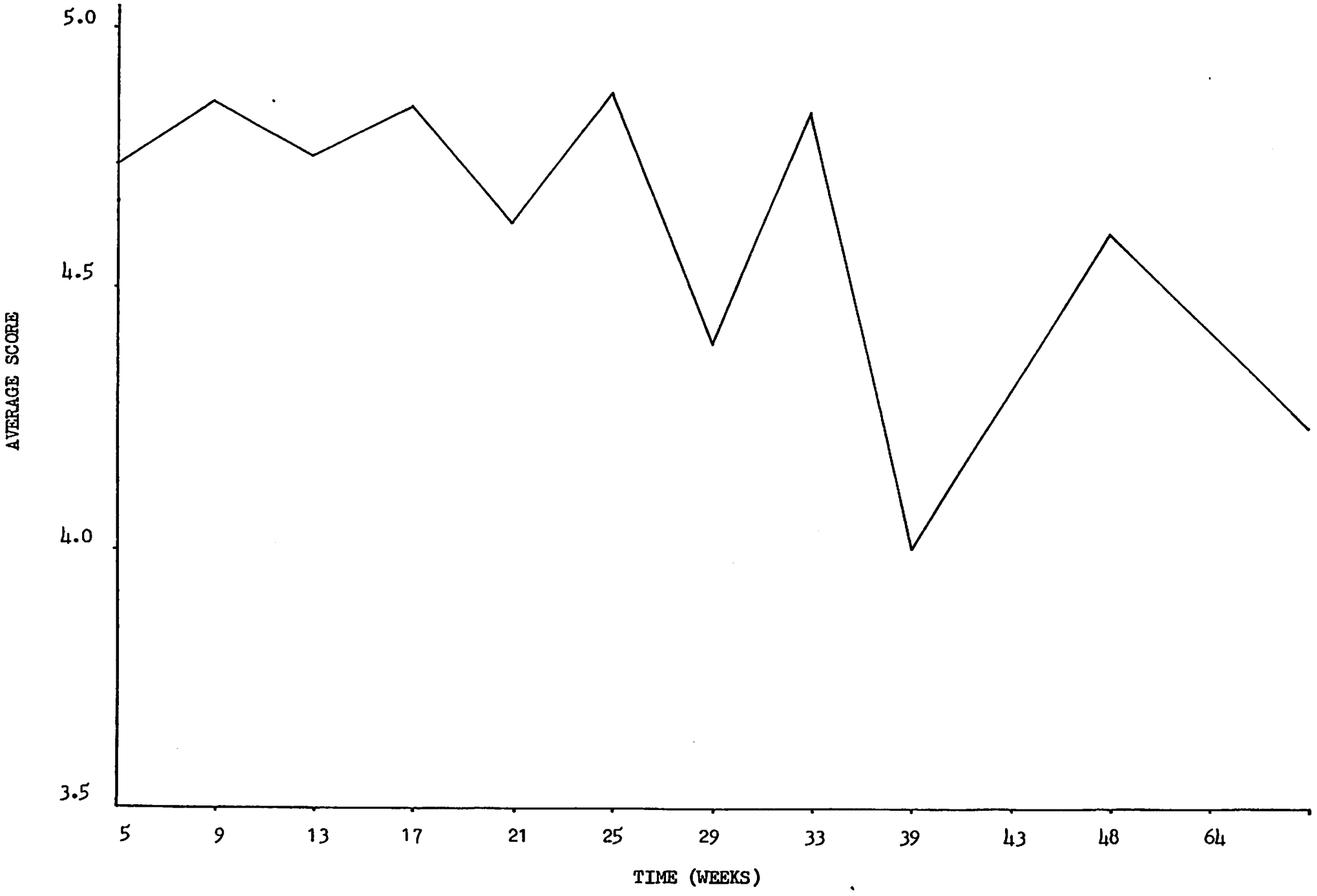


FIG. 3 EXAMPLE OF A SUDDEN DECLINE DURING THE TRIAL (OYSTER STEW : SAUCE SEPARATION)

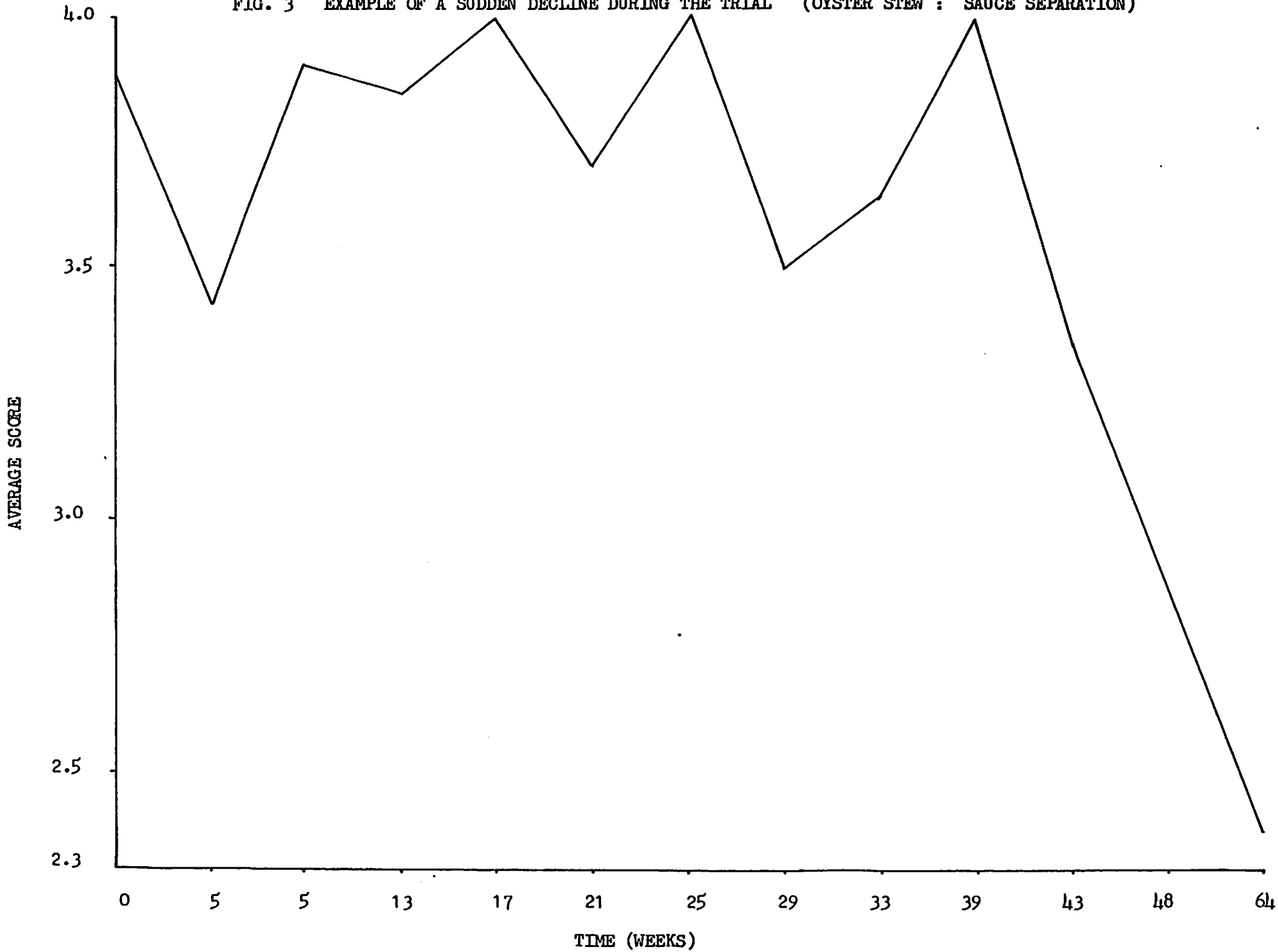
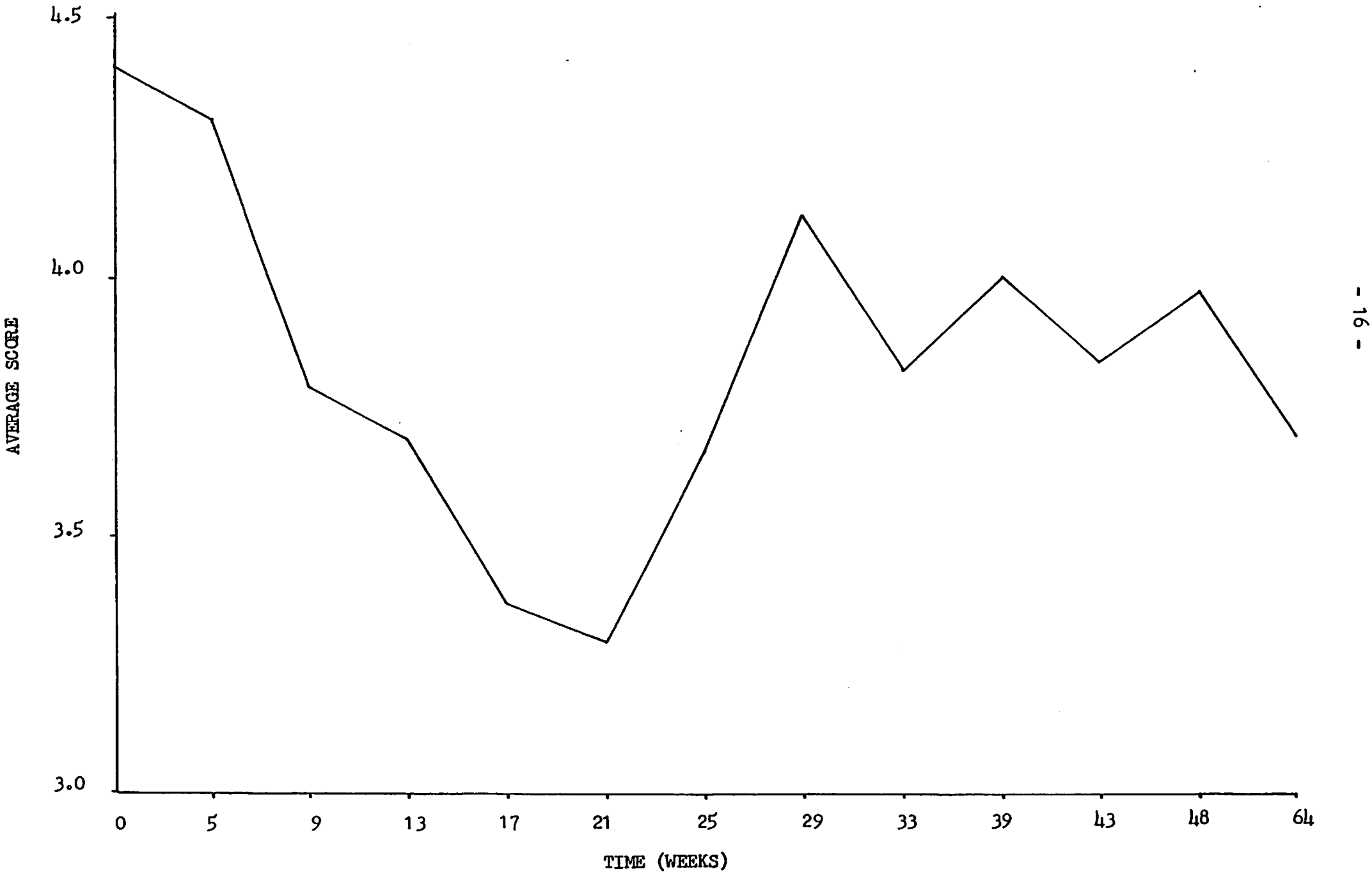


FIG. 4 EXAMPLE OF A DIP AND RECOVERY DURING THE TRIAL (OYSTERS IN STOUT FLAVOURED BATTER : TEXTURE)



APPENDIX 1

1.1 Breaded oysters

Ingredients	%
I.Q.F. oyster meats	
Batter to enrobe oysters:	
Flour	31.8
Salt	2.0
Pepper	0.2
Water	66.0
Breadcrumbs	

Method of preparation

Mix the flour, salt and pepper. Add sufficient water to make a thick batter. Beat well, scraping down to make batter smooth. Add the remaining water. Place sufficient breadcrumbs in a bowl to cover the battered oyster meats. Using a fork, dip a frozen oyster in the batter, drain on the side of the bowl and place in the crumbs. Using fingers, coat in crumbs, patting well into place, place on a sheet of aluminium foil and allow to stand for 10 minutes.

1.2 Oyster in a stout flavoured batter

Ingredients	%
I.Q.F. oyster meats	
Batter mix:	
Stout	64.9
Plain flour	31.4
Baking powder	2.2
Salt	1.1
Pepper	shake
Celacol Gum M2500 (Methyl Cellulose)	0.4
Plain flour for coating oysters	

(Celacol Gum is included in this recipe because it forms a crisp batter, but also allows the oyster meat to retain its moisture. It is manufactured by:- British Celanese Ltd., Chemical Sales Dept, P.O. Box 5, Spondon, Derby DE2 7BP.)

Method of preparation

Mix the dry ingredients together. Add sufficient stout to make a thick batter. Beat the batter for 2 minutes, scraping down to make batter smooth. Beat in the remainder of the stout and allow the batter to stand in a refrigerator for 15 minutes.

Coat oysters in flour using fingers and then in batter using a fork. Drain on the side of the bowl and drop into oil at 180°C (350°F) for 2 minutes. Drain on kitchen paper.

1.3 Oyster provencale in the half shell

Ingredients	%
Oyster meats, chopped or whole	
Sauce:	
Margarine	1.6
Chopped onion	4.8
Chopped garlic	0.3
Canned tomatoes	63.0
Dried parsley flakes	0.1
Dried thyme (soaked)	0.2
Salt	0.5
Black pepper	shake
Water	23.9
Purity SDW	2.4
Malt vinegar	2.4
Lemon juice	0.8

Method of preparation

Soak the dried thyme in cold water for at least an hour before weighing. Melt the margarine in a saucepan and saute the chopped onion and garlic. Using sufficient water, blend the Purity SDW. Add the tomatoes, tomato juice, parsley, thyme, salt, pepper and the rest of the water to the onions and garlic. Bring the mixture to the boil and simmer for 45 minutes. Remove from the heat, add the blended Purity SDW and bring the mixture back to the boil. Remove from the heat again and stir in the vinegar and the lemon juice.

Either place a few pieces of chopped oyster meat into each shell or use 1 complete oyster meat. (The number of pieces will depend on the size of the shell, but at least a "complete oyster" should be used in each shell.) Add sufficient sauce to cover the pieces of oyster meat.

1.4 Oyster mornay flan

Ingredients	%
I.Q.F. oyster meats	
Pastry flan case:	
Plain flour	60.5
Magarine	18.2
Cookeen	9.1
Salt	0.1
Water	12.1
Cheese sauce:	
Magarine	2.7
Plain flour	2.7
Purity SDW	3.5
Salt	0.5
Pepper	shake
Dry mustard	shake
Oyster liquor	6.7
Milk	60.3
Cheddar cheese	11.8
Gruyere cheese	11.8
Paprika to spinkle on top	

Preparation of the pastry

Cut the fat into cubes and allow to soften at room temperature. Add the salt to the flour and rub in the fat to make mixture like fine breadcrumbs. Add the water all at once and mix to a dough which is just sufficient to bind the mixture together.

Roll out the pastry and line a foil flan dish, easing to fit. Rest the uncooked flan case in a refrigerator for a short time.

Bake the flan case at 200°C (400°F) for approximately 35 minutes. Bake blind with greaseproof paper and dried peas, removing these after the pastry has started to rise, allowing the base to cook.

Sauce

Blend the Purity SDW in a little of the milk. Heat the magarine in the rest of the milk until boiling. Add the sieved flour and stir until the sauce thickens. Add the oyster liquor and the blended Purity SDW and bring the mixture to the boil, stirring all the time. Remove from the heat and stir in the grated cheese. Stir until the cheese is completely incorporated into the sauce, reheating if necessary to complete the process. Do not boil. Stir in sufficient oyster meats for the size of flan and add the mixture to the flan case. Sprinkle some paprika over the surface.

1.5 Steak, kidney and oyster pie

Ingredients

	%
Stewing steak (cubed)	39.1
Ox kidney (cubed)	15.7
Onion (chopped)	11.1
Cookeen	3.5
Plain flour	3.9
Water	25.9
Beef stock cube	0.2
Salt	0.5
Pepper	0.1
Oyster meats	
"Jus Rol" puff pastry	

Method of preparation

Toss the stewing steak and kidney cubes in seasoned flour and fry quickly in the cookeen to seal and brown. Transfer to a large pan and saute the chopped onion. Add the onion to the meat. Make a gravy * from the stock cube, water and the meat sediment in the frying pan. Add to the meat and onion, cover and simmer for about 2 hours, stirring from time to time.

(* This mixture should give a gravy of the required consistency, but it may be necessary to adjust the quantities involved.)

Allow 3 oyster meats per person and cover with cold water in a saucepan. Bring just to the boil, shaking gently. Drain and spread on top of the cooled meat mixture in a pie dish.

Roll the thawed pastry out to a size larger than the pie dish and cut off a "rim" of pastry. Place round edge of pie dish and use remainder of pastry for a lid, sealing the edges with the back of a knife. (The Authority allowed a small (7½ oz) packet of "Jus Rol" puff pastry per pie made in an aluminium foil dish measuring 203 mm (8 ins) in diameter and 13 mm (½ in) deep.)

1.6 Oyster and mushroom vol-au-vents

Ingredients	%
Magarine	4.1
Chopped mushrooms	20.7
Flour	2.3
Purity SDW	3.1
Salt	0.6
Pepper	shake
Oyster liquor	5.9
Milk	52.8
Chopped oyster meats	10.5

Preparation of the vol-au-vent cases

Thaw the vol-au-vent cases - the Authority used frozen "Jus Rol" cases - on baking sheets for 30-40 minutes at room temperature. Brush the cases with milk and bake at 220°C (425°F) for 10-15 minutes. Remove the central doughy part of the vol-au-vent using a knife, leaving the crisp outer shell.

Sauce

Saute the chopped mushrooms in melted magarine (but do not brown) in a saucepan. Stir in the flour and cook gently. Blend the Purity SDW with some of the milk. Stir in the rest of the milk and the oyster liquor and bring the sauce to the boil gradually, stirring constantly. Remove from the heat and stir in the blended Purity SDW and chopped oyster meats.

Fill each vol-au-vent case with the mixture and replace pastry lid.

1.7 Oyster stew

Ingredients	%
Butter	2.9
Chopped spring onions	0.6
Chopped red peppers	4.6
Chopped celery	4.6
Chopped parsley	0.3
Plain flour	1.7
Salt	0.3
Nutmeg	0.1
Black pepper	0.2
Purity SDW	2.3
Milk	26.3
Liquidised oyster gills in water	19.7
Oyster liquor	6.5
Medium dry white wine	9.7
Lemon juice	1.2
Sour cream	6.5
Chopped oyster meats	12.5

Method of preparation

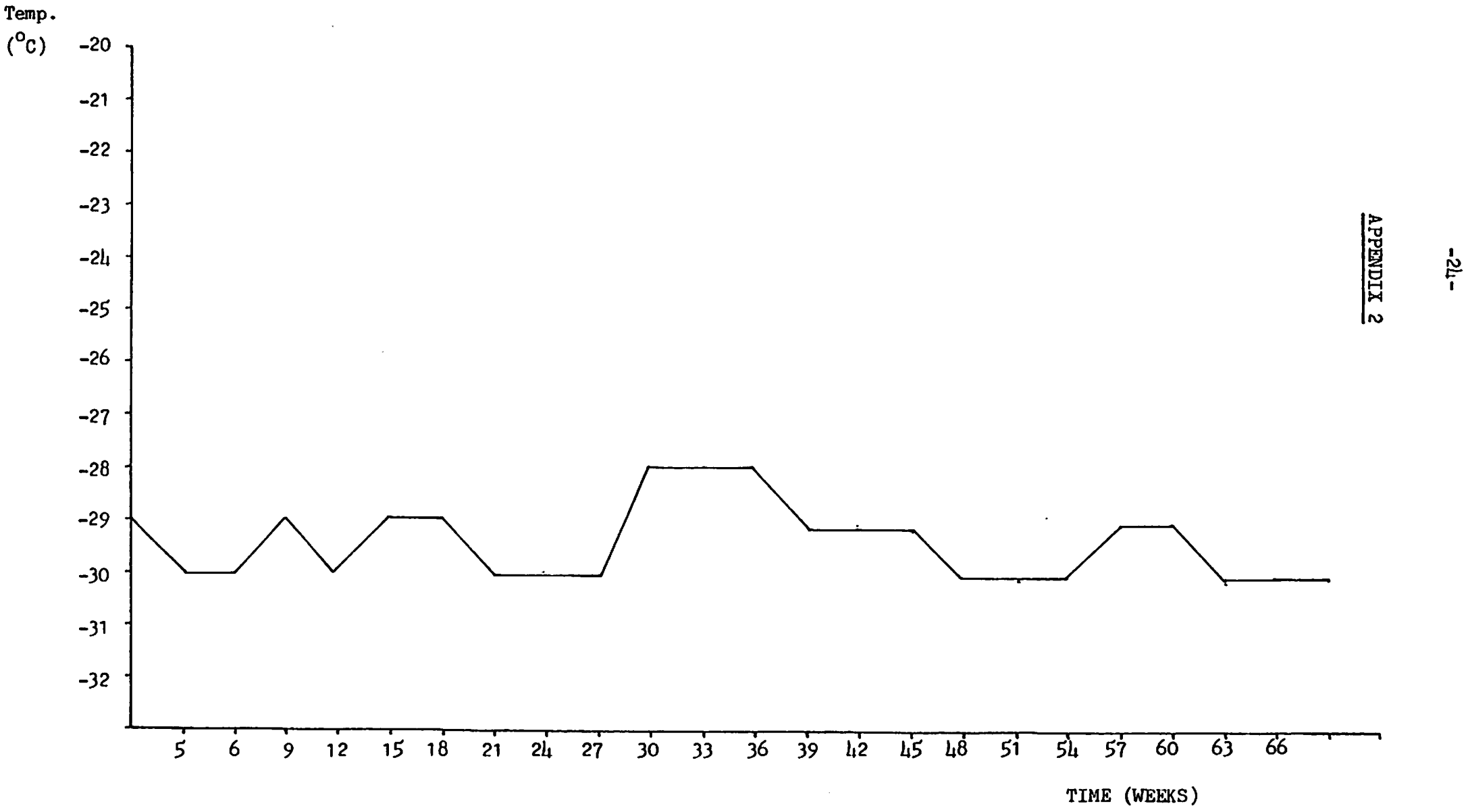
Saute the spring onions, red peppers, celery and parsley and stir in the flour, salt, pepper and nutmeg. Blend the Purity SDW with the milk. Add the water, oyster liquor, medium dry white wine and lemon juice and bring to the boil stirring continuously. Remove from the heat and stir in the cream, blended Purity SDW and oyster meats.

(In those recipes incorporating a sauce, Purity SDW, a modified starch, has been used in order to stabilise the sauce during freezing. If cornflour or wheatflour is used alone, the sauce will curdle and cause water to separate out on reheating.)

After preparation, all the products were frozen in a Southern and Redfern 40/90 air blast freezer at air temperature of -30°C (-20°F). The freezing times were thirty minutes for the breaded oysters, the oysters in stout flavoured batter, the oyster provencale in the half shell and the oyster stew, and one hour for the remaining products.

APPENDIX 2

AVERAGE COLD STORE TEMPERATURE DURING THE TRIAL PERIOD



APPENDIX 3

Storage Trial Acceptance Tasting

Breaded Oysters

3.1.

The White Fish Authority is at present carrying out storage trials on certain oyster based products. As part of this exercise we would appreciate your help in tasting the sample of breaded oysters, which will be presented to you, and answering the following questions. When answering, please would you mark the continuous scale beside each question at the point that you believe to be the most appropriate.

1. Colour

a) Do you think the colour of the breaded oyster is ?

- excellent
- good
- acceptable
- unpleasant
- totally unacceptable

b) Do you think the colour of the oyster meat is ?

- excellent
- good
- acceptable
- unpleasant
- totally unacceptable

2. Odour

Do you think the odour of the breaded oyster is ?

- excellent
- good
- acceptable
- unpleasant
- totally unacceptable

3. Flavour

a) Can you detect any rancid flavours ?

- no rancidity
- minimal rancidity
- slight rancidity (still acceptable)
- moderate rancidity
- unacceptable rancidity

b) Can you detect any off flavours ?

- no off flavours
- minimal off flavours
- slight off flavours (still acceptable)
- moderate off flavours
- unacceptable off flavours

4. Texture

Do you think the texture of the breaded oysters is ?

- excellent
- good
- acceptable
- unpleasant
- totally unacceptable

5. Dehydration

Can you detect any dehydration effects ?

- no dehydration
- minimal dehydration
- slight dehydration (still acceptable)
- moderate dehydration
- unacceptable dehydration

6. Any other comments you may like to make ? .....

.....

.....

.....

.....

Thank you for your co-operation in this exercise.

Storage Trial Acceptance Tasting

Oysters In Batter

3.2.

The White Fish Authority is at present carrying out storage trials on certain oyster based products. As part of this exercise we would appreciate your help in tasting the sample of oysters in batter, which will be presented to you, and answering the following questions. When answering, please would you mark the continuous scale beside each question at the point that you believe to be the most appropriate.

1) Colour

a) Do you think the colour of oyster in batter is ?

- excellent
- good
- acceptable
- unpleasant
- totally unacceptable

b) Do you think the colour of the oyster meat is ?

- excellent
- good
- acceptable
- unpleasant
- totally unacceptable

2) Odour

Do you think the odour of oyster in batter is ?

- excellent
- good
- acceptable
- unpleasant
- totally unacceptable

3) Flavour

a) Can you detect any rancid flavours ?

- no rancidity
- minimal rancidity
- slight rancidity (still acceptable)
- moderate rancidity
- unacceptable rancidity

b) Can you detect any off flavours ?

- no off flavours
- minimal off flavours
- slight off flavours (still acceptable)
- moderate off flavours
- unacceptable off flavours

4) Texture

Do you think the texture of oyster in batter is ?

- excellent
- good
- acceptable
- unpleasant
- totally unacceptable

5) Dehydration

Can you detect any dehydration effects ?

- no dehydration
- minimal dehydration
- slight dehydration (still acceptable)
- moderate dehydration
- unacceptable dehydration

6) Any other comments you may like to make ? .....

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Thank you for your co-operation in this exercise.

Storage Trial Acceptance Tasting

Half Shell Dishes

3.3.

The White Fish Authority is at present carrying out storage trials on certain oyster based products. As part of this exercise we would appreciate your help in tasting the sample of oyster half shell dish, which will be presented to you, and answering the following questions. When answering, please would you mark the continuous scale beside each question at the point that you believe to be the most appropriate.

1) Colour

a) Do you think the overall colour of the oyster half shell dish is ?

- excellent
- good
- acceptable
- unpleasant
- totally unacceptable

b) Do you think the colour of the oyster meat is ?

- excellent
- good
- acceptable
- unpleasant
- totally unacceptable

2) Odour

Do you think the odour of the oyster half shell dish is ?

- excellent
- good
- acceptable
- unpleasant
- totally unacceptable

3) Flavour

a) Can you detect any rancid flavours ?

- no rancidity
- minimal rancidity
- slight rancidity (still acceptable)
- moderate rancidity
- unacceptable rancidity

b) Can you detect any off flavours ?

- no off flavours
- minimal off flavours
- slight off flavours (still acceptable)
- moderate off flavours
- unacceptable off flavours

4) Texture

a) Do you think the overall texture of the oyster half shell dish is ?

- excellent
- good
- acceptable
- unpleasant
- totally unacceptable

b) Do you think the texture of the oyster meat is ?

- excellent
- good
- acceptable
- unpleasant
- totally unacceptable

5) Dehydration

Can you detect any dehydration

- no dehydration
- minimal dehydration
- slight dehydration (still acceptable)
- moderate dehydration
- unacceptable dehydration

6) Sauce

Can you detect any separation of the sauce ?

- no separation
- minimal separation
- slight separation (still acceptable)
- moderate separation
- unacceptable separation

7) Any other comments you may like to make ? .....
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Thank you for your co-operation in this exercise.

Storage Trial Acceptance Tasting

Oyster Flan

3.4.

The White Fish Authority is at present carrying out storage trials on certain oyster based products. As part of this exercise we would appreciate your help in tasting the sample of oyster flan, which will be presented to you, and answering the following questions. When answering, please would you mark the continuous scale beside each question at the point that you believe to be the most appropriate.

1) Colour

a) Do you think the overall colour of the oyster flan is ?

- excellent
- good
- acceptable
- unpleasant
- totally unacceptable

b) Do you think the colour of the oyster meat is ?

- excellent
- good
- acceptable
- unpleasant
- totally unacceptable

2) Odour

Do you think the odour of the oyster flan is ?

- excellent
- good
- acceptable
- unpleasant
- totally unacceptable

3) Flavour

a) Can you detect any rancid flavours ?

- no rancidity
- minimal rancidity
- slight rancidity (still acceptable)
- moderate rancidity
- unacceptable rancidity

b) Can you detect any off flavours ?

- no off flavours
- minimal off flavours
- slight off flavours (still acceptable)
- moderate off flavours
- unacceptable off flavours

4) Texture

a) Do you think the overall texture of the oyster flan is ?

- excellent
- good
- acceptable
- unpleasant
- totally unacceptable

b) Do you think the texture of the oyster meat is ?

- excellent
- good
- acceptable
- unpleasant
- totally unacceptable

5) Sauce

Can you detect any separation of the sauce ?

- no separation
- minimal separation
- slight separation (still acceptable)
- moderate separation
- unacceptable separation

6) Dehydration

Can you detect any dehydration effects ?

- no dehydration
- minimal dehydration
- slight dehydration (still acceptable)
- moderate dehydration
- unacceptable dehydration

7) Any other comments you may like to make ? .....
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Thank you for your co-operation in this exercise.

Storage Trial Acceptance Tasting

Oyster Pie

3.5.

The White Fish Authority is at present carrying out storage trials on certain oyster based products. As part of this exercise we would appreciate your help in tasting the sample of oyster pie, which will be presented to you, and answering the following questions. When answering, please would you mark the continuous scale beside each question at the point that you believe to be the most appropriate.

1) **Colour**

a) Do you think the overall colour of the oyster pie is ?

- excellent
- good
- acceptable
- unpleasant
- totally unacceptable

b) Do you think the colour of the oyster meat is ?

- excellent
- good
- acceptable
- unpleasant
- totally unacceptable

2) **Odour**

Do you think the odour of the oyster pie is ?

- excellent
- good
- acceptable
- unpleasant
- totally unacceptable

3) **Flavour**

a) Can you detect any rancid flavours ?

- no rancidity
- minimal rancidity
- slight rancidity (still acceptable)
- moderate rancidity
- unacceptable rancidity

b) Can you detect any off flavours ?

- no off flavours
- minimal off flavours
- slight off flavours (still acceptable)
- moderate off flavours
- unacceptable off flavours

4) Texture

a) Do you think the overall texture of the oyster pie is ?

- excellent
- good
- acceptable
- unpleasant
- totally unacceptable

b) Do you think the texture of the oyster meat is ?

- excellent
- good
- acceptable
- unpleasant
- totally unacceptable

5) Dehydration

Can you detect any dehydration effects ?

- no dehydration
- minimal dehydration
- slight dehydration (still acceptable)
- moderate dehydration
- unacceptable dehydration

6) Sauce

Can you detect any separation of the sauce ?

- no separation
- minimal separation
- slight separation (still acceptable)
- moderate separation
- unacceptable separation

7) Any other comments you may like to make ? .....
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Thank you for your co-operation in this exercise.

Storage Trial Acceptance Tasting

Oyster Vol-au-Vent

3.6.

The White Fish Authority is at present carrying out storage trials on certain oyster based products. As part of this exercise we would appreciate your help in tasting the sample of vol-au-vent, which will be presented to you, and answering the following questions. When answering, please would you mark the continuous scale beside each question at the point that you believe to be the most appropriate.

1. Colour

Do you think the overall colour of the oyster vol-au-vent is ?

- excellent
- good
- acceptable
- unpleasant
- totally unacceptable

2. Odour

Do you think the odour of the oyster vol-au-vent is ?

- excellent
- good
- acceptable
- unpleasant
- totally unacceptable

3. Flavour

a) Can you detect any rancid flavours ?

- no rancidity
- minimal rancidity
- slight rancidity (still acceptable)
- moderate rancidity
- unacceptable rancidity

b) Can you detect any off flavours ?

- no off flavours
- minimal off flavours
- slight off flavours (still acceptable)
- moderate off flavours
- unacceptable off flavours

4. Texture

Do you think the overall texture of the oyster vol-au-vent is ?

- excellent
- good
- acceptable
- unpleasant
- totally unacceptable

5. Dehydration

Can you detect any dehydration effects ?

- no dehydration
- minimal dehydration
- slight dehydration (still acceptable)
- moderate dehydration
- unacceptable dehydration

6. Sauce

Can you detect any separation of the sauce ?

- no separation
- minimal separation
- slight separation (still acceptable)
- moderate separation
- unacceptable separation

7. Any other comments you may like to make ? .....

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Thank you for your co-operation in this exercise.

Storage Trial Acceptance Tasting

Oyster Stew

3.7.

The White Fish Authority is at present carrying out storage trials on certain oyster based products. As part of this exercise we would appreciate your help in tasting the sample of oyster stew, which will be presented to you, and answering the following questions. When answering, please would you mark the continuous scale beside each question at the point that you believe to be the most appropriate.

1) Colour

a) Do you think the overall colour of the stew is ?

- excellent
- good
- acceptable
- unpleasant
- totally unacceptable

b) Do you think the colour of the oyster meat is ?

- excellent
- good
- acceptable
- unpleasant
- totally unacceptable

2) Odour

Do you think the odour of the oyster stew is ?

- excellent
- good
- acceptable
- unpleasant
- totally unacceptable

3) Flavour

a) Can you detect any rancid flavours ?

- no rancidity
- minimal rancidity
- slight rancidity (still acceptable)
- moderate rancidity
- unacceptable rancidity

b) Can you detect any off flavours ?

- no off flavours
- minimal off flavours
- slight off flavours (still acceptable)
- moderate off flavours
- unacceptable off flavours

4) Texture

a) Do you think the overall texture of the stew is ?

- excellent
- good
- acceptable
- unpleasant
- totally unacceptable

b) Do you think the texture of the oyster meat is ?

- excellent
- good
- acceptable
- unpleasant
- totally unacceptable

5) Sauce

Can you detect any separation of the sauce part of the stew ?

- no separation
- minimal separation
- slight separation (still acceptable)
- moderate separation
- unacceptable separation

6) Any other comments you may like to make ? .....
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Thank you for your co-operation in this exercise.