SCOTTISH FOOD ENFORCENT LIAISON COMMITTEE
FOOD STANDARDS SUB-COMMITTEE
SURVEY NUMBER: SF24

Microbiological quality of prepared washed salad leaves supplied to retailers and caterers

REPORT
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Food Standards Sub-Committee (FSSC)

Survey SF24: Microbiological quality of prepared washed salad leaves supplied to retailers and caterers

The Scottish Food Enforcement Liaison Committee (SFELC) co-ordinates the food law enforcement, sampling and surveillance activities of Scottish local authorities and comprises representatives of central and local government, professional organisations, consumers and industry.

The committee provides a forum for the discussion of topics relevant to any current problems and may initiate surveys or projects or co-ordinate specific investigations initiated by the local Food Liaison Groups that have been set up in four geographical areas.

Food Liaison Groups consist of representatives from Scottish local authorities and are concerned with consistency of food law enforcement activities in their area.

The remit of the Food Standards Sub Committee (FSSC) is to act as a focus group for delivering the Scottish Food Enforcement Liaison Committee's strategic aims by considering and recommending appropriate measures for the practical implementation of any food standards initiatives remitted to them from the Committee

Summary

80 samples of prepared washed salad leaves supplied to retailers and caterers were taken and submitted for microbiological examination. Only one sample (1.25%) was unsatisfactory, due to the level of Escherichia coli bacteria present.

These results are a marked improvement on those in a previous SFELC survey.

Background

Previous surveys have raised concerns over the microbiological quality of salads. This concern is exacerbated by suggestions that lettuce may have been a vehicle of infection in some food poisoning outbreaks.

SFELC Survey SF10, *microbiological quality of lettuce used in catering premises*, (1) did not reveal any firm relationship between the degree of washing/processing of leaves bought by caterers and microbiological quality.

This survey aimed to focus on the microbiological quality of bagged washed/prepared salad leaves.

Sampling

80 samples of prepared washed salad leaves were collected, from retailers and caterers, by local authority sampling officers in Scotland between 1st November 2009 and 31st March 2010. 19 environmental health departments participated in this survey. Samples were analysed by the four public analyst laboratories in Scotland.

A copy of the survey protocol, outlining the sampling and analysis procedures employed, is shown in Annex 1. The participating local authorities and public analyst laboratories are shown in Annex 2. The samples taken are summarised in Annex 3.

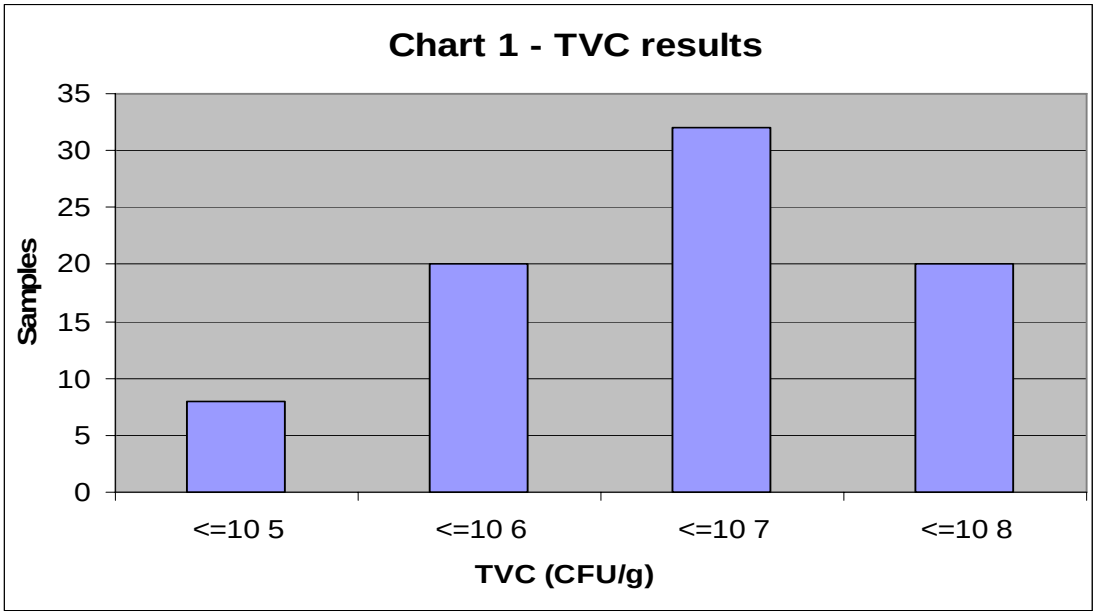
Results
The samples were examined for a number of types of bacteria and compared against the HPA guidelines for ready to eat foods (2). The results are summarised in Table 1.

Parameter	Samples analysed	Samples Satisfactory	Samples Borderline	Samples Unsatisfactory
Overall	80	79	0	1
Pathogens				
Campylobacter	73	73	-	0
Salmonella	79	79	-	0
E coli O157	78	78	-	0
Listeria monocytogenes	80	80	0	0
Staphylococcus aureus	79	79	0	0
Indicators				
E coli	80	79	0	1
Listeria species	80	80	0	0
Total viable count	80	-	-	-

Table 1 – Summary of results

Only one sample was unsatisfactory. This was a bag of “Italian salad with herbs” which had an unsatisfactory level of Escherichia coli present. The other results, including all of those for pathogens, were satisfactory.

The HPA guidelines do not give criteria for TVC levels in prepared salads. It is noted that TVC levels are likely to be much higher than for other ready to eat foods. Chart 1 examines the TVC levels found in the samples submitted. All of the results were in the range predicted within the HPA guidelines.



Discussion

Overall the results of this survey were encouraging. All but one of the 80 samples was satisfactory – the remaining sample failed due to the level of Escherichia coli, an indicator organism. However, the results of survey SF10 did show a higher failure rate (8%) for prepared salads.

This improvement in standards is welcomed and shows that food of a satisfactory quality can be produced in this sector. It is important that producers and processors work to ensure good levels of hygiene and environmental health departments enforcing food law at these premises should continue to promote good practices.

Recommendations

Environmental Health Departments enforcing food safety law in premises preparing and washing salad leaves should continue to consider the efficacy of the washing and packing process as part of their routine food hygiene inspections.

References

1. SFELC. Survey SF10: Microbiological quality of lettuce used in catering premises. 2006
2. Health Protection Agency. Guidelines for Assessing the Microbiological Safety of Ready-to-Eat Foods. London: Health Protection Agency, November 2009.

Annex 1 – Survey protocol

1 Background

Previous surveys have raised concerns over the microbiological quality of salads. This concern is exacerbated by suggestions that lettuce may have been a vehicle of infection in some food poisoning outbreaks.

SFELC Survey SF10, *microbiological quality of lettuce used in catering premises*, did not reveal any firm relationship between the degree of washing/processing of leaves bought by caterers and microbiological quality.

This survey aims to focus on the microbiological quality of bagged washed/prepared salad leaves.

2 Survey Period

The survey period is November 2009 – March 2010. LAs may, however, start sampling as soon as this protocol is issued.

3 Participation

All Liaison Groups are invited to participate in the survey.
The minimum number of samples allocated to each Liaison Group is as follows

East of Scotland	***20 samples***
Lothian and Borders	**20 samples**
North of Scotland	**20 samples**
West of Scotland	**40 samples**

4 Resource Implications

It is anticipated that the cost of this survey can be accommodated within normal sampling and analysis arrangements for each local authority.

5 Sampling, Examination and Reporting

Sampling

Initial Procedures

1. Pre-select premises from which samples are to be taken.
2. Ensure that the following equipment is available
    - Coolbox with ice-packs and bottle of water, or a suitable datalogger.
    - Labels
    - Plastic Food Bags
    - Calibrated thermometer

Sample Collection Procedures

1. Samples should be collected from any retail or catering premises
2. Each sample should consist of at least 150 g of unopened bagged salad leaves. If necessary more than one unopened bag from the same batch should be submitted to ensure the minimum sample size is met.
3. The sample container should be labelled in accordance with the requirements of the laboratory being used.

4. Samples should be placed in a coolbox and delivered to the laboratory as soon as possible, and preferably, under normal circumstances, no later that 6 hours after sampling.

5. Sampling officers do not need to fill in a survey proforma.

6. However, **it is important that FSS is completed uniformly for this survey. The protocol summary advises on the required FSS input.**

Transportation of Samples

Samples should be transported in an insulated coolbox capable of operating at a temperature of 1-8°C.

1. Pre-cool the insulated box in a refrigerator for at least 1 hour (preferably overnight). Place a small screw-capped bottle of water , or a datalogger, within the coolbox.

2. Load with sufficient ice packs to ensure adequate cooling.

3. Once samples are delivered to the laboratory, the internal temperature of the coolbox should be measured by placing the thermometer in the bottle of water. The temperature should be recorded on the sample form before the samples are handed over. This step is not required if a datalogger is used.

4. Where samples are delivered to the laboratory by a third party, the coolbox should be clearly marked to indicate that the temperature should be recorded on site by laboratory personnel, and that the coolbox should not be opened by office staff. Again, this step is not required if a datalogger is used.

Microbiology Laboratory Protocol

Sample Preparation

Using a suitable sterile implement, aseptically weigh a representative portion of the sample into a sterile stomacher bag or other equivalent sterile homogenisation system. Add by weight (to the nearest gram), sufficient sterile diluent to create a 1:10 suspension.

The homogenate prepared in sterile diluent is the primary (10^{-1}) sample suspension. A dilution should be prepared by adding 1ml of the homogenised primary sample solution to a bottle containing 9ml of sterile diluent. This is the secondary dilution (10^{-2}). This process should be continued until sufficient dilution of the sample has taken place. Use the primary decimal dilution and/or further decimal dilutions thereof to inoculate the appropriate media as described in the following enumeration methods.

TVC 30

Samples should be examined using the spread plate method described in ISO 4833/1991 or equivalent accredited method. This method requires the preparation of a series of spread plates using decimal dilutions of the sample. Plate Count Agar should be used and plates should be incubated at 30°C for 3 days and then counted. Alternatively any equivalent method may be used. Whichever method is used it is important to use a procedure which will allow counts to be made in the range 10^{2} – 10^{8} /gm.

E.coli

Samples should be examined in accordance with the method described in BS 5763: Part 13 (1995) (Enumeration of E.coli using membranes). Alternatively any equivalent accredited method may be used. Whichever method is used it is important to use a procedure which will allow counts to be made in the range 10 - 10^{4} /gm.

Listeria monocytogenes and Listeria spp

Samples should be examined in accordance with the methods described in BS ISO 11290 Parts 1 and 2 or equivalent accredited method. All isolates of *Listeria monocytogenes* should be sent to the Food Safety Microbiology Reference Laboratory at Colindale for further typing. Whichever method is used it is important to use a procedure which will allow counts to be made in the range 10-10^3/gm.

Coagulase-positive staphylococci

Samples should be examined in accordance with the method described in BSENISO 6888-1:1999, "Enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species), Part 1: Technique using Baird-Parker agar medium, or equivalent accredited method. All isolates should be sent to the Food Safety Microbiology Reference Laboratory at Colindale for further typing.

E.coli 0157

Samples should be examined in accordance with the method described in BS EN ISO 166544 (2001) or equivalent accredited method. All isolates should be sent to the Scottish E.coli Reference Laboratory for typing.

Salmonella spp

Samples should be examined using the method described in BS EN 12824 : 1998, or a suitable UKAS accredited method. All isolates of Salmonella should be sent to the Scottish Salmonella reference laboratory for typing.

Campylobacter spp

Samples should be examined in accordance with the method described in BS 5763 Part 17:1996 and ISO10272:1995 or any equivalent accredited method.

All isolates of Campylobacter spp. should be sent without delay to the Laboratory of Enteric Pathogens(LEP) at the HPA Specialist and Reference Microbiology Division(SRMD) Colindale, for confirmation, antibiotic sensitivity and typing as appropriate AND to Dr Ken Forbes, Medical Microbiology, Aberdeen University, Polwarth Building, Medical School, Foresterhill, Aberdeen AB25 2ZD for MLST typing as requested by FSA Scotland.

Reporting
Samples will be reported to local authorities in the normal manner. Results will be compared to the HPA guidelines for the microbiological quality of some ready to eat foods sampled at the point of sale.

Results should be **uploaded to the FSS central database by 1 June 2010**.

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SURVEY NO: SF24

Microbiological quality of prepared washed salad leaves

Protocol summary

Samples

Samples should be taken from retailers or caterers.

Samples targeted by the survey are bags of prepared/washed salad leaves.

Samplers should ensure that a variety of salad types and suppliers are sampled

150g of product should be taken per sample. Take multiple bags from the same batch if necessary.

Sampling period

The survey period is November 2009 – January 2010. LAs may, however, start sampling as soon as this protocol is issued.

FSS Input

- **Reason for sample taken:** Surveillance/monitoring
- **Sample was taken as part of a survey**
- **Survey Body:** SFELC
- **Survey Ref:** **SF24**
- **Category tree :** 10.03.03.01 Prepared salad

Analysis

- TVC 30
- E.coli
- Listeria monocytogenes and Listeria spp
- E.coli 0157
- Coagulase-positive staphylococci
- Salmonella spp
- Campylobacter spp

Pass/Fail

Results will be compared against the HPA Guidelines for ready to eat foods.

Reporting

Samples will be reported to local authorities in the normal manner. Results will be compared to the HPA guidelines for the microbiological quality of some ready to eat foods sampled at the point of sale.

Results should be **uploaded to the FSS central database by 1 June 2010**

Annex 2 – Participating environmental health departments and laboratories

Scottish environmental health departments that participated in survey SF24

- Aberdeen City Council
- Aberdeenshire Council
- Angus Council
- North Ayrshire Council
- South Ayrshire Council
- Dumfries and Galloway Council
- East Dunbartonshire Council
- Dundee City Council
- City of Edinburgh Council
- Fife Council
- Glasgow City Council
- Highland Council
- East Lothian Council
- West Lothian Council
- Midlothian Council
- Moray Council
- Perth and Kinross Council
- East Renfrewshire Council
- Shetland Islands Council

Scottish public analyst laboratories participating in survey SF24

- Aberdeen City Council
- City of Edinburgh Council
- Glasgow Scientific Services
- Tayside Scientific Services

Annex 3 – Samples submitted

Sample	Description
760COMN10004413	Italian salad with herbs
760COMN10004414	Rocket salad
760COMN10004415	Italian style salad
760COMN10004416	Crispy leaf salad
760COMN10004417	Seasonal four leaf salad (mild nurture)
761Z0105620003367	Baby leaf herb salad
761Z0105620003369	Seasonal baby leaf
761Z0305620003360	Fresh baby leaf spinach
761Z0405620003352	Fresh tastes crispy leaf
761Z0405620003353	French style salad
762FHQLB10000997	Sweet baby leaf mix
762FHQLB10000998	Crunchy salad mix
762FHQLB10000999	Crunchy salad mix
762FHQLB10001000	Crunchy salad mix
762FHQLB10001001	Iceberg lettuce
765HQ06080001618	Crunchy salad
765HQ06080001686	Iceberg lettuce
766HQ03490002630	Leafy salad
766HQ03490002633	Sweet & crunchy salad
766HQ03490002766	Iceberg lettuce
766HQ03490002767	Summer salad
770DGD04650000627	Bagged washed salad
770DGD04650000628	Bagged washed salad
770DGD04650000632	Italian salad with herbs
770DGD04650000633	Crispy salad
771HQ06230000816	Tenderleaf salad
771HQ06230000817	Bumper Italian style salad
771HQ06230000818	Iceberg lettuce
771HQ06230000819	Crispy leaf salad
772HQ05110001746	Exotic leaves
772HQ05110001747	Leafy salad
772HQ05110001748	Leafy salad
772HQ05110001749	Wild rocket, watercress and spinach
772HQ05110001750	Salad bowl
773HQXX010006349	Iceberg lettuce
773HQXX010006350	Crispy salad
773HQXX010006352	Crunchy salad mix
773HQXX010006355	Peppered rocket salad
773HQXX010006356	Essential iceberg
773HQXX010006359	Iceberg lettuce
773HQXX010006433	Washed and ready to eat salad
773HQXX010006439	Leafy salad
775KDY14110000489	Italian style salad
775KDY14110000490	Cosmopolitan salad
775KDY14110000491	Four leaf salad
775WEMYS14110000492	Crispy salad
776HQ06430005461	Rocket salad leaves
776HQ06430005588	Pre-packed bag of lettuce
776HQ06430005610	Crunchy salad
776HQ06430005611	Iceberg lettuce
776HQ06430005612	Crispy salad
776HQ06430005613	Babyleaf salad
776HQ06430005619	Prepared salad
776HQ06430005620	Catering seasonal leafy salad
781HQ05150002098	Chopped iceberg lettuce
782HQ0005944	French style salad
782HQXX010005945	Italian style salad
782HQXX010005947	Baby leaf salad
782HQXX010005949	Rocket salad
783HQ05890000950	Baby leaf herb salad
783HQ05890000952	Iceberg lettuce
783HQ05890000953	Sweet & crunchy salad
783HQ05890001143	Italian style salad
783HQ05890001144	Italian style salad
783HQ05890001145	Crunchy salad mix
783HQ05890001146	Crunchy salad mix
783HQ05890001147	Crunchy salad mix
784HQ06260001702	Wild rocket leaves
784HQ06260001703	Mixed baby leaves
786HQ16810000006	Rocket
786HQ16810000007	Mizuna
786HQ16810000008	Red chard
786HQ16810000009	Salad bowl
786HQ16810000010	Baby leaf herb salad
787HQ04960001464	Sweet and crunchy salad
787HQ04960001465	Crispy leaf
787HQ04960001466	Leafy salad
787HQ04960001467	Iceberg lettuce
789HQ12860000237	Crunchy salad mix
789HQ12860000238	Iceberg lettuce

Annex 1 – Summary and recommendations of Survey Reports discussed at FSSC

SF24 - Microbiological quality of prepared washed salad leaves supplied to retailers and caterers

80 samples of prepared washed salad leaves supplied to retailers and caterers were taken and submitted for microbiological examination. Only one sample (1.25%) was unsatisfactory, due to the level of Escherichia coli bacteria present.

These results are a marked improvement on those in a previous SFELC survey.

Recommendations

Environmental Health Departments enforcing food safety law in premises preparing and washing salad leaves should continue to consider the efficacy of the washing and packing process as part of their routine food hygiene inspections.

NS12 - The Microbiological Quality of Salad Garnish Used to Accompany Takeaway Food

This survey was designed to investigate the microbiological quality of salad garnish used to accompany a wide range of takeaway food served from catering establishments in the North of Scotland Food Liaison Group area.

The results show that of 49 samples submitted for examination 13 (27%) were found to be unsatisfactory. Of the 13 unsatisfactory samples 12 (92%) failed in respect of TVC, Salmonella was isolated from one sample and E coli was isolated from one sample.

Recommendations

1) Due to only 49 of the original planned 108 samples (45%) being submitted the survey should be repeated in order to gauge any improvement in preparation, storage and handling techniques.
2) Due the majority of submitted samples not being examined for Listeria because of the use of two different protocols the survey should be repeated.
3) The monitoring of salad garnish to accompany takeaway food should continue to be
   included in Local Authority sampling plans.
4) Procedures adopted in respect of the purchase, preparation, storage and service of
   salad garnish and other factors such as quality at time of delivery, washing techniques and display times should be considered by food businesses and specifically documented in the food safety management system.

NS20 - Salt and Fat Content of Home Made Soup from Catering Premises

Salt and fat contents of home made take-away soups varied significantly and were comparable with the levels found in canned, pouched and fresh soup. The largest factor affecting the salt and fat consumed is the portion size which is out of the control of the consumer when purchasing take-away soup. The survey identified a wide range of portions from 115g to 470g but the smallest portion did not provide the

smallest salt intake nor the largest portion the largest salt intake. Home made soups are usually perceived as a healthy choice and the survey confirmed the majority are low in fat but contribute, on average, one third of the recommended daily salt intake alone.

Recommendations

1. That take-away containers be marked with their size/weight. This would assist the public to determine portion size, salt content and fat intakes from non prepacked foods which could assist with calorific intake and weight control.

2. That a traffic light system for menus be developed but be based on the portion size served not per 100g which could be misleading to the public when the portion size is unknown and determined by the premises.

3. Composite ingredients used by caterers have the salt and fat content declared.

4. That nutritional training and/or information, particularly in relation to salt and fat, be made more available to caterers.