Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

Western Region
Public Analyst's Laboratory
Régiún an Iarthair
Saotharlann an Anailisí Phoiblí

Annual Report 2008
Tuarascáil bhliantúil 2008

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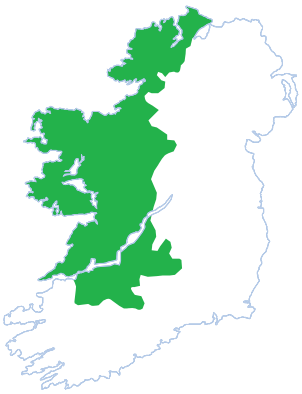
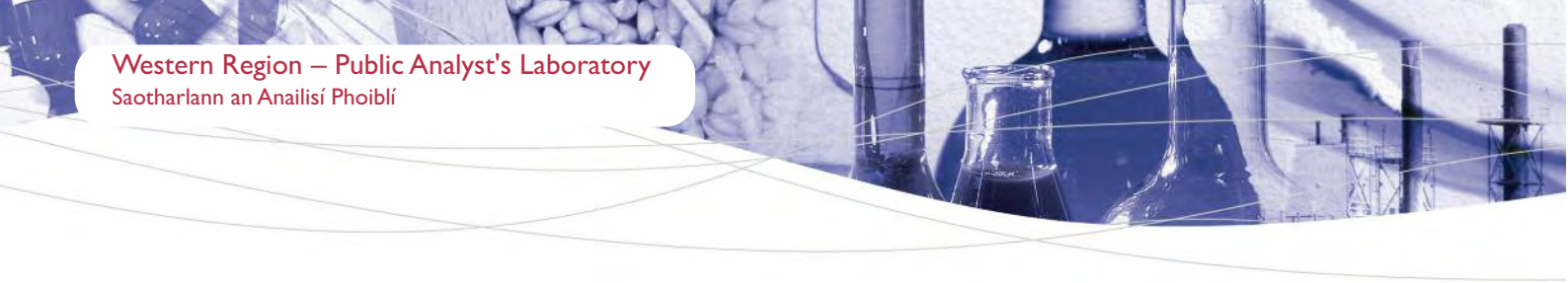


For year ended 31st December, 2008



ACKNOWLEDGEMENTS

This report summarises the work carried out by the Public Analyst's Laboratory during the year 2008.

The work was conducted against a background of increasing service demands, and shrinking resources due to restrictions in staff recruitment as a result of overall cost containment measures adopted by the HSE.

I would like to acknowledge the dedication and commitment demonstrated during the year by the staff, in the face of these increasing demands and pressures.

Rory Mannion
Public Analyst
July 2009

This report is available on the HSE website (www.hse.ie) in both Irish and English.

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1. INTRODUCTION

1.1 Role of the Laboratory.

The Galway Regional Public Analyst's Laboratory provides an independent, scientifically based chemical analytical and advisory service in the areas of food, water, pharmaceuticals, cosmetics, toxicology and air pollution monitoring.
Public Analysts' Laboratories are also located in Dublin and in Cork.
Our fundamental role is one of Public Health Protection.

1.2 Customer Base.

The laboratory has a local, regional and national customer base.
The local customers comprise of local Environmental Health Officers (EHOs), private individuals, local industry, local hospitals and Galway Local Authorities. Regionally, the laboratory provides a service to HSE West, which incorporates the geographic region from Donegal to Limerick/North Tipperary, and to Local Authorities in this area. Our National customers are mainly the Food Safety Authority of Ireland (FSAI), the Irish Medicines Board (IMB) and Government Departments (e.g. Health and Children; Agriculture, Fisheries and Food; Communications, Energy and Natural Resources).

1.3 Sample Sources.

The laboratory is contracted to analyse samples of food received from EHOs on behalf of the FSAI.
Food samples are also received directly from the FSAI for specific surveys, and from the Sea Fisheries Protection Authority, Local Industry and the General Public.

Water samples are received from EHOs on behalf of Local Authorities.
Samples are also received from the general public, local industry and hospitals, and directly from Local Authorities.

The laboratory is contracted to analyse samples of pharmaceuticals from the IMB for surveillance and enforcement purposes. A service is also provided to the Pharmaceutical Society of Ireland and the Department of Health and Children.

Cosmetic samples are received from EHOs as part of a surveillance programme and from the IMB.

Samples for toxicological analysis are received from local Hospital Pathologists and Physicians, and from Veterinary Surgeons and the general public.

The laboratory performs air pollution monitoring on behalf of Galway City Council.
Miscellaneous samples are also tested for a varying range of analytes.

1.4 Administration.

The laboratory is administered by the Primary Continuing and Community Care (PCCC) Directorate within the Health Service Executive.

1.5 Finance.

The budget allocation for the laboratory for 2008 was €3.09 million.
This covers all our pay and non-pay expenses.
The income received by the laboratory was €199,453.
The laboratory operated within budget with a surplus of €18,370.

1.6 Laboratory Review.

A National review of the Public Analysts' Laboratories and the Public Health Microbiology laboratories was commenced in 2007 and completed at the end of 2008. The review group members included representatives from the Public Analysts' Laboratories, The Public Health Microbiology Laboratories, and senior managers from

Population Health, PCCC, and the National Hospitals Office. The terms of reference of the review were as follows:

- To review current strengths, weaknesses, opportunities and obstacles in the delivery of the laboratory services including a review of existing structures, reporting arrangements and resources;
- To review current internal and external networking relationships and the potential for the future development of these and others to enhance the delivery of the service;
- To recommend a configuration for the appropriate and sustainable delivery of these services within the HSE.

The final report was published this year and makes the following recommendations -

RECOMMENDATION 1

The establishment of a unified and integrated Laboratory Service which would unify the existing chemistry and microbiology disciplines in the PALs and OFMLs.

RECOMMENDATION 2

The establishment of a full-time post of National Scientific Laboratory Director to coordinate, develop and deliver an efficient national service on an ongoing basis. A key function of this post would be to identify and secure appropriate capital and resources to implement the recommendations of this Review Group. During the period while awaiting the appointment of the National Scientific Laboratory Director an interim implementation group representative of the laboratories and an appropriate HSE service area would be established to progress the recommendations of this report.

RECOMMENDATION 3

After agreeing on all required safeguards (e.g. ring-fencing of resources, local ownership of service delivery, continuation of local support services) the HSE laboratories should transfer to the most appropriate service area of the HSE.

RECOMMENDATION 4

That all relevant stakeholders be consulted to explore the best option for the provision of laboratory services in the Dublin North East Area.

RECOMMENDATION 5

Establishment of a Working Group to review laboratory staff structures within the context of a unified integrated laboratory service. This should be conducted in collaboration with laboratory staff, unions, HSE and the HSEA.

RECOMMENDATION 6

Establishment of a Laboratory LIMS/ICT Working Group with clearly defined terms of reference.

RECOMMENDATION 7

Establishment of an Accommodation Working Group with clearly defined terms of reference.

This review follows on from the ***"Strategic Development Review of Health Board Food Control Laboratories"*** commissioned by the Department of Health and Children and published in 2004. The recommendations in this report have not yet been implemented.

It is very important that a mechanism is put in place to implement the above recommendations. Otherwise, the inherent benefits will not be realised and a great deal of time and effort will have been wasted.

1.7 Summary/Highlights of 2008.

2008 was a busy year for the laboratory. The programmed testing of foods, waters, medicines, cosmetics etc progressed as normal. A particular issue in 2008 was the relatively high contamination rate found in certain cosmetics, particularly in cheaper, imported cosmetics marketed for children (see Section 6 of Report). Also, the Lead (Pb) contamination in Galway's public water supply (see Section 3.4) required intensive investigation. Both of the above Heavy Metals issues resulted in increased testing in 2008.

The work performed in the area of salt reduction in food appears to be of considerable public health significance (see Section 2.5).

The Pharmaceutical Laboratory was confirmed in its role as an Official Medicines Control Laboratory, following its successful inspection by the IMB in April 2008 (see Section 5).

A number of different reviews currently relate to this laboratory (see Sections 1.6 and 2.2.2). A key driver here is the need for enhanced national co-ordination of the testing service(s).

1.8 Workload.

The laboratory has four main divisions,

i. Food,
ii. Water/Environmental and Air Monitoring,
iii. Pharmaceuticals/Toxicology,
iv. General/Administration.

The numbers of samples tested during 2008 are as follows:

Foods	2,706
Waters	11,855
Pharmaceuticals	119
Toxicology	202
Cosmetics	221
Air-Monitoring	865
Miscellaneous	45
Total	**16,013**

2. FOOD

2.1 Service Provided.

Food in our region (HSE West) is monitored officially for chemical safety and quality, and for legislative compliance. The Environmental Health Officers (EHOs) of HSE, and the Food Safety Authority of Ireland (FSAI, www.fsai.ie) are our main clients, -see also Table 1 - sample sources. Testing is performed for contaminants, additives, allergens, nutrients, composition and labelling etc. Private Food Complaints and Food Export certification samples are also tested for industry and the public. Some applied research projects are carried out in conjunction with *Safe*food, www.safefood.eu. The authorised officers (EHOs), and FSAI as appropriate, deal with the incidences of detected non-compliances in samples.

2.2 Food Safety Laboratory Service:

2.2.1 Sampling and Analysis of Food: an essential element of Food Safety.

Protecting the Food Supply is important for reasons of Food Safety, Consumer Protection, ensuring Legislative Compliance and facilitating Trade. Food Safety activities may be classified as Reactionary or Preventive. Food testing in reactionary situations (food alerts, outbreaks, complaints etc) is critical in identifying and finding the source of contamination. Preventive activities ensure against the production and consumption of unsafe and low quality food. The principal mechanism of ensuring food safety, lies in the preventive food safety measures (auto-control, HACCP etc) taken by the food industry. Avenues open to Official Food Safety Bodies in guarding the food supply include:

- Education, Advice and Liaison with the food industry and consumers;
- Food Safety Promotion: fostering a culture of food safety;
- Production and Enforcement of Legislation

The above distinct, interlinked activities are used to varying extents by all national food safety authorities. HSE's main activity in food safety has been in legislative enforcement. Two distinct ways of monitoring and ensuring food safety through official legislative enforcement are:

- **Monitoring the overall food safety systems and operations** (HACCP etc) in place in the food industry (all stages of food chain). This is performed through inspection and audit, and monitoring for compliance with general and specific legislative requirements, in particular food hygiene requirements;
- **Monitoring the safety and quality of food** through laboratory analysis. Samples are monitored for compliance with specific legislative standards of safety and with general safety and compositional criteria.

There is no legislation or guidelines prescribing what proportion of overall food law enforcement budget/resources should be allocated to each of the above; there are different emphases in different countries. In particular, different EU member states have differing levels of coordination between their inspection programmes and their food sampling/analysis programmes. The above two food safety mechanisms are complementary and synergistic.

There is extensive legislation covering limits for contaminants, additives, nutrients etc in food. Also there is now a vast array of food types available to the consumer. In practice only a small, targeted proportion of the test parameter/food group combinations can be prioritised and tested (see Sampling Analysis Programme, - Section 2.3.1).

2.2.2 Food Safety Laboratory Service – Developments & Reviews etc.

A Food Safety Laboratory Service (FSLS) is provided by the HSE's 7 Official Food Microbiology and 3 Public Analysts' Laboratories. In July 2004 a report entitled: "A Strategic Developmental Review of Health Board Food Control Laboratories (safefood 2004)" was published, http://www.safefood.eu/Global/Publications/Research%20reports/StrategicDevelopmentReviewOfHealthBoardFoodControlLaboratories.pdf?epslanguage=en. The Report contains 16 recommendations including, inter alia: combining the Labs into a unified multi-sited Food Safety Laboratory Service. The Recommendations have yet to be implemented, although some aspects of the report are dealt with by the HSE National Review of Public Analysts' Laboratories and Public Health Microbiology Laboratories (see Section 1.6 above).

A third Review relevant to this laboratory is being performed by the (HSE) Laboratory Services Modernisation Group. This group was set up following the Teamwork Report of 2008 into modernising the Irish laboratory medicine services. (http://hse.ie/eng/Publications/services/Hospitals/Teamwork_report_Implementing_a_new_system_of_service_delivery_for_laboratory_medicine_services.pdf.) Separately, a review of Food Sampling & Analysis in HSE began in 2008, as was agreed in the Service Contract between FSAI and HSE. The HSE Food Laboratories, Environmental Health Officers and FSAI are participating in the review.

A further development within the Public Analysts' Service is that the 3 laboratories are consolidating on a more formal basis the allocation of testing specialisations and core testing functions developed over the past few years.

2.3 Food Testing (Chemical) Results for 2008.

2.3.1 Regional Chemical Surveillance Programme 2008.

Nationally coordinated, Regional Food Surveillance (Chemical) Programmes are drawn-up by the Regional Food Committees, including the EHO services and

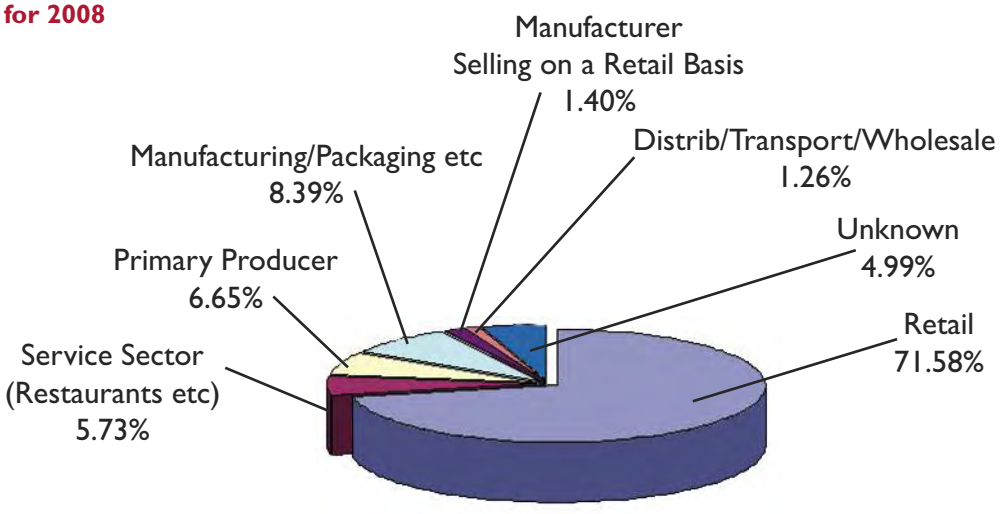
Laboratories, in partnership with FSAI. FSAI is the Central National Competent Authority for food law enforcement in Ireland. The Authority has multi-disciplinary food safety expertise in the areas of Food Science and Toxicology, Risk Analysis, Public Health and Food Inspection etc. Also, FSAI participates in the many EU committees and working groups dealing with the chemical safety (contaminants, additives etc) of foodstuffs. The production of Ireland's Multi-Annual National Control Plan (MANCP) is carried out by FSAI and it includes food surveillance aspects.

A list of risk-based, chemical surveillance/testing priorities is produced annually by FSAI. These priorities, together with the regional sampling needs identified by the Environmental Health Service (EHOs), provide the basis for the Regional Food (Chemical) Sampling/Analysis Programmes. The extensive range of foodstuffs and chemical test parameters presents a particular challenge in devising the programmes. HSE West's programmed chemical surveillance for 2008 is outlined in Appendix 1.

2.3.2 Results for 2008.

All of the programmed surveys for 2008 were carried out, although a lower number (2,706) of samples than anticipated (ca. 3,000 to 3,200) was received; both the non-programmed and the programmed sample numbers were down. The Figure below indicates the 'stage' at which Western Region EHO samples (excluding complaints) were taken in 2008.

Results for 2008



The majority of samples (71.58%) were taken at retail level.

Adverse Reports (as % of samples analysed, excluding complaints)									
Year	2008	2007	2006	2005	2004	2003	2002	2001	2000
%	7.4	8.3	5.4	4.7	5.0	4.5	5.1	4.2	5.1

2.3.3 Statistics for 2008.

The region covered by the laboratory, i.e. HSE West, has a population of 1,010,690 (2006 census) and the number of food samples tested in 2008 was 2,706, i.e. 2.68 per 1,000 population. The samples consisted of 126 complaints [see 2.6] and 2,580 others. Of the 2,580 above, adverse reports (i.e. test results indicating breaches of Irish Food Law Standards) were issued on 192 (7.4 %); this figure of 7.4 % compares to the figures for previous years.

Of the 192 breaches, 138 were due to labelling deficiencies, largely in samples from ethnic retail premises. The categories of foodstuffs and infringements are summarised for complaints and other samples in Appendix 2. Tables 1 and 2 below summarise the work for 2008 according to the sampling region and source.

2.3.4 Overall Summary of Results and Food Quality 2008.

A wide range of 'surveillance' for contaminants/ additives/ labelling etc and public health nutrition testing (salt & folic acid) was carried out in 2008. Results are reported by test parameter in sections 2.4 to 2.7 below, with summaries given in Appendices 2 and 4. The number of samples found in contravention of limits for aflatoxins and benzo-[a]-pyrene decreased in 2008 (see Appendix 4). As in previous years, some instances of food contamination were found and these were dealt with by the EHOs and FSAI as appropriate.

Table 1 Food Sample Sources (2008)

Submitted by/Sample Type	Number of Samples	Number on which Adverse Reports were issued
Environmental Health Officers (HSE West)		
Informal Routine (Sampling programme)	1825	184
Public (Food Complaints via EHOs)	115	63
Inspection samples (non-programmed)	44	3
Follow-up samples (non-programmed)	47	1
General Public		
Complaints	11	6
Others	71	2
Food Safety Authority of Ireland	324	0
Sea Fisheries Protection Agency	7	2
Marine Institute	40	0
Laboratory Q.A. & Method Development etc	77	0
Export Certification	145	0
OVERALL TOTAL	**2,706**	**261**

Table 2 HSE West Food Sample Sources (2008)

Community Care County Area EHO Service	Number of Samples submitted	Number per 1,000 population* *Based on 2006 census
Galway	486	2.10
Mayo	190	1.54
Roscommon	86	1.47
Clare	173	1.56
Limerick	316	2.33
North Tipperary/East Limerick	171	1.49
Donegal	378	2.57
Sligo/Leitrim	231	2.54

Overall, a reduced level of contaminated samples was found in 2008. Also, the number of submitted food complaint samples decreased, compared to previous years (see 2.6 below). The number of Hazard/ Contamination Reports (see 2.7) issued was 7.
The overall results reported here for 2008 indicate a relatively low level of contamination, and a generally high quality of food in our region.

Note: Ireland has a multi-agency system in place for official surveillance of food,- see Appendix 3 for an outline. To obtain an overall picture of the safety and hygiene of our food supply, see Annual Reports of FSAI, - www.fsai.ie and those of the agencies (Dept. of Agriculture, Fisheries & Food; Dept. of Communications Energy and Natural Resources; Local Authorities; HSE etc) involved in the official control of food.

2.4 Food Contaminants.

2.4.1 General.

Chemical contaminants and residues in foods are monitored in the context of food safety, legislative compliance and consumer protection/reassurance; they may be classified broadly as follows:

- Natural Toxins (fungal, algal, bacterial, natural plant & animal toxins etc);
- Industrial/Environmental contaminants (Melamine, Heavy Metals, Dioxins etc);
- Food Processing contaminants (Acrylamide, Benzo-[a]-pyrene etc);
- Allergens (e.g. Peanut protein, Gluten etc);
- Plant and Animal Treatment Residues (Pesticides, Antibiotics etc).

National co-ordination of contaminants' surveillance in Ireland means that many contaminants/residues are monitored nationally as specialisations in single laboratories. The testing described in this report reflects the contaminant priorities identified by HSE West and FSAI.

Notes: (i) Other Official Agencies and FSAI (see Appendix 3 and www.fsai.ie) also produce reports on contaminants & residues in food. The Ashtown Food Research Centre (Teagasc) produces an annual National Food Residue Database for Ireland - (see http://nfrd.teagasc.ie/)

(ii) Data on microbiological contamination of food is to be found in the reports of the Official Food Microbiology Laboratories, in reports of other Departments/Agencies (see Appendix 3) and in FSAI (www.fsai.ie) reports.

(iii) FSAI produces regular, updated overviews of EU and Irish Food Contaminants' Legislation.

2.4.2 Food Contaminants – EC Regulation 1881/2006 (& 1126/2007, amending).

EC Regulation 1881/2006 sets limits for a range of chemical contaminants in food. Relevant testing performed here in 2008 is summarised in Table 3.

Table 3: Food Contaminants EC Regulation 1881/2006, Principal Testing in 2008.

Contaminant	Limits	Sample types	Total	Complying	Non complying
Aflatoxins[1] ($B_{1,2}$, $G_{1,2}$)	2.0µg/kg (B_1)	Nuts	69	69	0
	4.0µg/kg (Total)	Peanut Butter	21	21	0
		Rice	18	17	1
		Dried Fruit	13	13	0
		Maize & Maize products	10	10	0
		Others	18	18	0
Sub-total Aflatoxins			**149**	**148**	**1**
Fumonisins[2] ($B_{1,2}$)	1,000 µg/kg	Maize & Maize products	8	7	1
	800 µg/kg	Maize Breakfast Cereals/Snacks	1	1	0
	–	Basmati Rice	1	1	0
Lead[3] (Pb)	0.8mg/dm^2 or 4.0mg/L	Ceramic tableware	35	35	0
	0.3 to 1.5mg/kg	Fish & Fishery products	82	82	0
	0.05mg/kg	Beverage bases	132	132	0
	1.0mg/kg (EU Proposed)	Food supplements	29	29	0
	0.020mg/kg	Infant formulae	15	15	0
	0.10mg/kg	Meat & Meat products	13	13	0
	10.0µg/L	Water	89	89	0
	0.20mg/kg	Rice	43	43	0
	-	Fruits, nuts, cereals etc.	13	11	2
	-	Miscellaneous	61	61	0
Sub-total Lead (Pb)			**512**	**510**	**2**
Cadmium[3] (Cd)	0.07mg/dm^2 or 0.3mg/L	Ceramic tableware	35	35	0
	0.05 to 1.0mg/kg	Fish & Fishery products	83	83	0
	-	Beverage bases	132	132	0
	0.5mg/kg (EU Proposed)	Food supplements	29	29	0
	-	Infant formulae	15	15	0
	0.05 to 1.0mg/kg	Meat & Meat products	13	13	0
	5.0µg/L	Water	89	89	0
	0.20mg/kg	Rice	43	43	0
	-	Fruits, nuts, cereals etc.	12	12	0
	-	Miscellaneous	61	61	0
Sub-total Cadmium (Cd)			**512**	**512**	**0**
Mercury[3] (Hg)	0.50 to 1.0mg/kg	Fish & Fishery products	3	3	0
	-	Water	20	20	0
Sub-total Mercury (Hg)			**23**	**23**	**0**
Benzo-[a]-pyrene[4]	2.0µg/kg (Oil)	Food & Oil Supplements etc	42	42	0
	2.0µg/kg; 5.0µg/kg	Fish	27	27	0
	2.0µg/kg	Miscellaneous Oils	27	27	0
	2.0µg/kg	Canned Fish in Oil	19	19	0
Sub-total Benzo-[a]-pyrene			**115**	**115**	**0**
3-MCPD[5]	0.02 mg/kg (Soy Sauces & H.V.P.)	Soy Sauces (13) Other sauces, seasonings, gravy mixes, etc (17)	30	30	0
Nitrate	Refer to Regulation Annex, Section 1	Lettuce (2) Mixed green veg. (1)	3	3	0

Please see notes on next page.

[1] Aflatoxins are fungal toxins which may contaminate certain foods (nuts, dried fruit etc), particularly from the tropics/sub-tropics.

[2] Fumonisins are fungal toxins which occasionally contaminate foods such as corn and corn products.

[3] For data on EU exposure to Heavy Metals (As, Cd, Pb & Hg) see EU SCOOP Report http://ec.europa.eu/food/food/chemicalsafety/contaminants/scoop_3-2-11_heavy_metals_report_en.pdf

[4] Benzo-[a]-pyrene is a polycyclic aromatic hydrocarbon (PAH) which may contaminate smoked/burned foods. See EU PAH report at http://ec.europa.eu/food/food/chemicalsafety/contaminants/scoop_3-2-12_final_report_pah_en.pdf

[5] 3-MCPD, 3-monochloropropanediol, may contaminate acid-hydrolysed foods, including soy sauces.

Aflatoxin B_1 is a genotoxic carcinogen which may contaminate nuts, dried fruits etc. Port-level detection of **Aflatoxins** in imported foods is one of the most common sources of EU Rapid Alert Notifications (see Section 2.7). In 2008, just 1 of the 149 samples (0.7%) tested here, a basmati rice, had excessive Aflatoxin B_1 (4.5µg/kg). FSAI and HSE are in the process of switching the focus of sampling for aflatoxins testing from retail level to bulk import and wholesale levels; this may be a factor in the low number of non-complying samples found in 2008.

Efforts, including legislation, to control exposure to **Heavy Metals** have reduced human intake. Ceramic articles intended to come into contact with foodstuffs have maximum levels set for Lead and Cadmium as per Council Directive 84/500/EC. In 2008, a study of 35 ceramic foodware items for Lead and Cadmium was carried out and no samples were found to be contaminated. 15 Infant formulae were also tested for various heavy metals in 2008, none were found to be contaminated.

The availability of an ICP-MS has allowed initial investigations on the analysis of foods for metals other than Lead, Cadmium, Arsenic and Mercury. 89 miscellaneous bottled water samples were screened for 12 metallic contaminants, and none were found to be excessive.

Benzo-[a]-pyrene, a genotoxic carcinogen, may be formed in smoked/burned foods. Excessive levels were not found in any of the 115 samples tested in 2008, representing a decrease over recent years. An elevated level of Benzo[a]pyrene (68µg/kg) was detected in one food supplement sample (propolis). However, at present there is no legislative limit for food supplements, but the expected exposure is not likely to be significant as intakes (of propolis) are generally low.

2.4.3 Other Food Contaminants.

Table 4 below summarises testing for contaminants etc other than those covered in EC Regulation No. 1881/2006, as performed here in 2008.

The **Gluten** proteins contained in wheat, barley, rye and their cross-bred varieties are toxic to coeliacs. CODEX and EC Commission Regulation No. 41/2009 set limits as follows:

- 100 mg/kg for "very low gluten" foods, having one or more gluten-containing ingredients, and processed to reduce gluten (such products may be labelled as "gluten-free" if containing less than 20 mg/kg gluten).
- 20 mg/kg for naturally gluten-free foods.

An FSAI Working Group on Gluten has compiled a report on Gluten-free Food, - see http://www.fsai.ie/assets/0/86/204/4a70f71b-7c15-4e72-bd6f-c85deba481de.pdf.

In 2008 a diverse range of gluten-free foods from pharmacies, health food shops, supermarkets and local

Table 4: Other Food Contaminants/Residues: Summary of Results for 2008.

Contaminant	Limit(s) (Legal source)	Sample Types	Total	Complying	Non complying
Marine Biotoxins[1]	EU Decisions 2002/225/EC & 2002/226/EC				
DSP Toxins[2]	160 µg/kg	Mussels, Oysters, Clams	20	20	0
AZA Toxins[3]	160 µg/kg	Mussels, Oysters, Clams	20	20	0
ASP Toxins[4]	20 mg/kg	As above	36	36	0
Gluten (EHO sampling)[8]	200 ppm	Rendered[5] Gluten-free foods	22	21	1
	100 ppm		22	22	0
	20ppm (Codex)*	Naturally Gluten-free foods	50	49	1
Gluten (private samples)	200ppm	Rendered[5] Gluten-free foods	2	2	0
	100ppm	(Codex)*	4	4	0
	20 ppm (Codex)*	Naturally Gluten-free foods	26	26	0
Benzene	10 µg/L (FSAI- WHO drinking water Limit)	Soft drinks Jams Sauces Jellies	16 6 6 1	29	0
Histamine/Biogenic Amines[6]	200mg/kg (EC Reg 2073/2005..)	Scombroid Fish etc (Tuna, Mackerel…)	128	126	2
Arsenic (As)	10 µg/L	Water	88	88	0
	0.5 mg/kg (SI 44 of 1972)	Beverage Bases	128	128	0
		Infant Formulae	13	13	0
		Miscellaneous	9	9	0
Anti-bacterial Substances (ABS)[7] **(EC Four-Plate test)**	2 mm 'Zone' of Inhibition	Poultry, Pork, Fish etc	18 12 8	18 12 8	0 0 0
Others		Psyllium Husks	1	0	1

[1] These toxins may accumulate in shellfish grown in seawater with excessive marine algae. Retail/Catering level (largely) sampling by EHO service (three samples out-contracted to Marine Institute). Principal official monitoring is at production level by Dept. of CMNR/Marine Institute

[2] Diarrhetic Shellfish Poisoning (DSP). [3] Azaspiracid (AZA). [4] Amnesic Shellfish Poisoning (ASP).

[5] Refers in the main to Gluten-free foods based on wheat starch (ie with gluten removed).

[6] Biogenic Amines tested for: Histamine, Tyramine, Cadaverine & Putrescine. Biogenic amines are produced as a result of the breakdown of amino acids in fish by bacteria. Histamine- or Scombroid poisoning is an allergy-like intoxication.

[7] Principal official monitoring is at production level (meat plants etc) by the Dept. of Agriculture, Food and Rural Development and by the Local Authorities.

[8] Includes Routine, Inspection and Complaint samples * Codex Standard 118 – 1979 was revised and published in late 2008, this standard reduced the previous level of 200ppm for 'rendered gluten-free foods' to 100ppm; these foods are also now known as 'reduced-gluten, suitable for most coeliacs' (as per the FSAI report on Gluten-Free foods – 2008)

manufacturers were received. The overall results were satisfactory with only two non-complying samples out of 126 tested (see Table 4).

Of the 128 fish samples tested here in 2008 for **Histamine** and 3 other biogenic amines, viz. Putrescine, Cadaverine and Tyramine, 2 mackerel samples had excessive Histamine (752 & 1,074mg/kg). 9 samples

contained elevated (>100 mg/kg) Cadaverine and 4 had elevated (>100 mg/kg) Tyramine; 1 had elevated (>100 mg/kg) Putrescine. For a general report on Histamine poisoning see http://www.fda.gov/Food/GuidanceComplianceRegulatoryInformation/GuidanceDocuments/Seafood/FishandFisheriesProductsHazardsandControlsGuide/ucm091910.htm.

No residues of **anti-bacterial substances (ABS)** were found in any of the 38 samples of fresh meat and fish screened in 2008 by the EC Four-Plate Test, as has been the case for the last 8 years.

2.5 Nutrition/Composition, Additives, Labelling etc.

Sodium/Salt in Food: excess consumption of salt (sodium chloride) is considered to pose a considerable public health risk. The Food Safety Authority of Ireland (FSAI) has recently published a report entitled *"Salt and*

Table 5: Summary of Nutritional/Compositional Testing Results 2008.

Parameter(s)	Food Types etc		Samples Tested	Average Results (g/100g)	Range of Results (g/100g)
'Salt' (Na/K)	Processed Meats (Ham etc.)	Sodium	26	0.85	0.44-1.13
	FSAI survey	Potassium	26	0.41	0.2-0.86
	Bread	Sodium	6	0.41	0.4-0.43
	FSAI survey	Potassium	6	0.23	0.11-0.36
	Breakfast Cereals[4]	Sodium	24	0.13	<0.01-0.3
	FSAI survey	Potassium	24	0.39	0.16-0.62
	Spreads & Butters	Sodium	12	0.33	<0.01-0.53
	FSAI survey	Potassium	12	0.04	0.02-0.06
	Crisps, Popcorn & Snacks	Sodium	124	0.60	<0.01-1.93
	FSAI survey	Potassium	124	0.80	0.02-1.91
	'Ready' Meals[1]	Sodium	27	0.25	0.07-0.83
	HSE regional samples	Potassium	27	0.21	0.12-0.34
	"Low-Sodium" products[2]	Sodium	7	0.02	<0.01-0.05
	HSE regional survey	Potassium	7	5.95	<0.01-40.51
	Misc. Processed foods[3]	Sodium	38	0.30	<0.01- 2.13
	HSE regional samples	Potassium	33	0.23	<0.01- 0.79
	"Low-Sodium" Salts	Sodium	3	15.4	12.8 - 17.3
		Potassium	2	24.7	23 – 26.3

Parameter(s)	Food Types		Samples Tested	Results Range (µg/100g)	Total Samples Tested
Folic Acid	Pilot Fortification Study	White Breads	20	<20 - 163	84 Breads
		Wholemeal Bread	20	<20 - 134	
		Brown Soda Bread	20	<20 - 93	
		Baguette Bread	24	<20 - 175	
		White Flour	12	<20 - 431	48 Flours
		Wholemeal Flour	12	<20 - 363	
		Brown Soda Flour	12	<20 - 421	
		Baguette Flour	12	<20 - 326	

1 Including packaged curries, lasagne, chicken dishes, cottage pie, pasta dishes etc from supermarkets…

2 Including porridge, rice cakes, baby food, food supplement & seasoning etc.

3 Including prepared dishes, breakfast cereals, fruit drink, beans, sauces, seasoning, rice pudding, beetroot, meatballs, snacks, water, powdered milk, crisps, salt, crackers, soup, fish, baby food, popcorn.

4 Includes largely "low-salt" cereals and mueslis etc.

Health: Review of the Scientific Evidence and Recommendations for Public Policy in Ireland", - www.fsai.ie/uploadedFiles/Science_and_Health/salt_report-1.pdf. The report quotes a calculated reduction of ca. 1,700 deaths in Ireland per year from strokes and ischaemic heart disease, if recommended reductions in salt intake are achieved. FSAI is implementing a programme, in conjunction with the food industry, to reduce salt levels in the major, salt-containing, processed foods. The stated aim is to reduce the average intake of salt to 6 grams per day (from 10 grams per day) by 2010. Also, a common EU framework for an overall reduction in salt intake of 16% minimum by 2012 was agreed in 2008. To date, extensive monitoring of a range of foods (breads, breakfast cereals, ready meals, soups, sauces, processed meats and snacks/crisps etc) for 'salt' (Sodium/Potassium)

Table 6: Summary of Additives/Labelling/Compositional Results 2008.

Parameter(s)	Food Types etc	No. of Samples Tested & Results		
		Total	Complying	Non complying
Additives				
Benzoates & Sorbates[1]	Soft drinks (54), Ices & Desserts (7), Salads (7) & Others (4)	72	66	6
Sulphur Dioxide[1] (Sulphites)	Meats/Fish (38), Wines/Beers (24), Prawns / Crabs/Shrimp (47), Dried fruit/Veg. (74), Others (7)	190	182	8
Nitrites & Nitrates[1]	Cured Meats & Meat Products (64)	64	62	2
Artificial Sweeteners[2] (i.e. Acesulfame K, Aspartame & Saccharin)	Non-alcoholic Drinks (19), Yoghurts (11), Preserves (6), Sauces (3) & Confectionery (2)	41	41	0
Glutamic Acid	Meat & Meat products (4), Sauces (22), Soup (3), Rice (1)	30	28	2
Food Irradiation[3] A) Photostimulated luminescence screening	Herbs/Spices/Seasonings (105), Vitamins & Food Supplements (95) Noodles (17) Soups/Sauces (8), Seeds (3), Fruit & Veg (4), PARNUTS (7) & Others (3)	242	242	0
B) Confirmatory Thermoluminescence testing (SUERC, Scotland)	Herbs/Spices (4), Vitamins & Food Supplements (5) & Noodles (2)	11	11	0
Dairy Testing[4]	Dairy products(Milk, cream etc)	135	130	5
General Labelling	Miscellaneous Packaged Foods	438	276	165
Alcoholic Strength	Pub-level Spirits	34	33	1
Others: pH Moisture Ref. Index/Sol. Solids Fat	Miscellaneous Food Types Miscellaneous Food Types Jams etc Low-fat foods(excl. dairy products)	194 7 6 15	194 7 6 15	0 0 0 0
			Range of Results	
Acid Value (AV)[5]	In-use cooking oils (from takeaways, restaurants etc)	27	0.2 – 7.5	
DPTGs[6]			<3 – 20.6%	

[1] Authorisation and limits set in Statutory Instrument No. 58 of 2004 (as amended by Statutory Instrument No. 40 of 2008). EU Directives require member states to monitor their usage and intake of Additives. Excessive Sodium Nitrate was detected in a sample of rashers and a sample of ham.

[2] Authorisation and limits set in Statutory Instrument No. 34 of 2008.

[3] S.I. 297 of 2000 authorises irradiation of herbs, spices and vegetable seasonings. Irradiated foods must be labelled as such.

[4] Varying Tests: General Labelling, ALP ('Pasteurisation'), Inhibitory Substances (Delvo test), Extraneous water, Fat, Protein, Lead (see Table 3)…

[5] Acid Value is a measure of the extent of hydrolysis of the oils. A traditional, control 'limit' of 3.0 is used in UK.

[6] DPTGs = Di- and polymerised triglycerides, indicators of the extent of thermal abuse or prolonged use of cooking oils. A Dutch limit of 15.0% exists.

has been carried out in this laboratory, - see *FSAI News Jan/Feb 2008,Vol 10, Issue 1,* for an FSAI update on progress on reducing salt levels. The 2008 results for the FSAI programme are summarized in Table 5 above. In addition, the Table includes results from HSE's own regional testing (samples from EHOs) of a range of foods including Ready Meals, "Low-sodium" Foods and Miscellaneous Processed Foods.

The average sodium value of 0.25 g/100g for the Ready Meals is reassuringly low. Just one product (5 samples) in the 27 samples tested had sodium levels significantly greater (>50%) than the labelled value. Also, the "low sodium" samples averaged just 0.02 g/100g, all samples complied with the upper limit of 0.12 g/100g for foods labelled as "low-sodium" (Regulation (EC) No. 1924 of 2006. Nutrition and Health Claims..). Of the 38 miscellaneous processed foods tested, the labelled and actual levels agreed well, with just one result excessive relative to the labelled values.

The UK, who have taken a lead in salt reduction, have produced an extensive range of processed foods with targeted reductions to be achieved by 2012. It is likely that a similar approach will be taken in Ireland.

Folic Acid: 132 samples of bread and flour were tested in 2008 for Folic Acid on behalf of FSAI, in connection with a recommendation to introduce fortification of flour in Ireland. The samples were submitted by a pilot plant in conjunction with FSAI, and they consisted of 84 fortified breads and 48 flours. The issue of whether there should be mandatory fortification of flour with folic acid has been put on hold in Ireland (see report of the Implementation Group on Folic Acid Fortification www.fsai.ie/assets/0/86/204/cc3c2261-7dc8-4225-bf79-9a47fbc2287b.pdf). Two key factors here are: (1): that population blood levels of folic acid appear to have increased and (2): a reported, possible association between fortification and increased levels of bowel cancer.

General Labelling: Statutory Instrument No. 483 of 2002 consolidates legislation on the labelling of foodstuffs in general. An overview of labelling legislation and enforcement procedures etc is outlined in a FSAI publication (The Labelling of Food in Ireland – FSAI 2007). http://www.fsai.ie/assets/0/86/204/5dfb809a-7902-4f03-bb6a-6e25a5a09736.pdf.

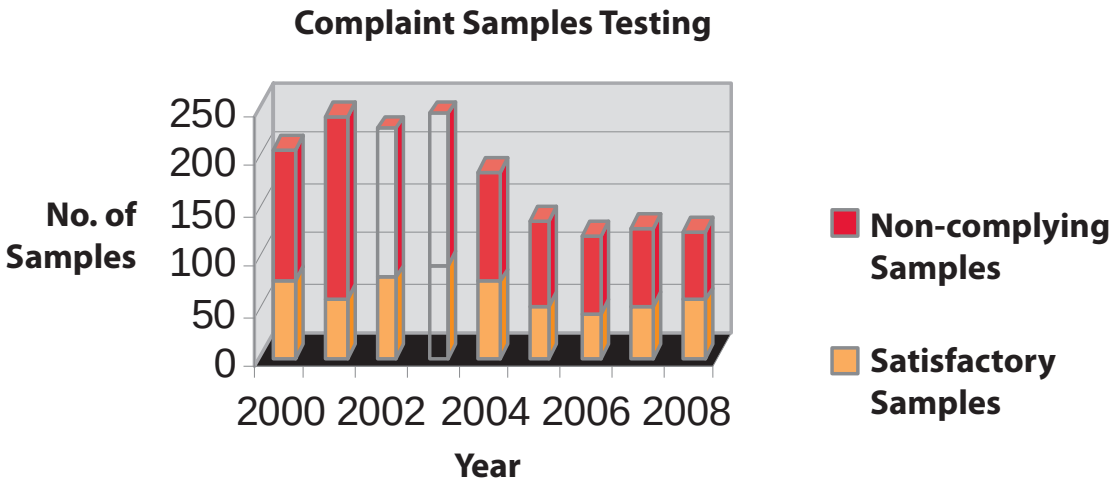
The European Commission has begun a consultation process on an overhaul of European food labelling legislation which is to continue into 2009.

In 2008, 438 samples were examined here for compliance with labelling legislation and 165 were designated as being in breach of labelling legislation. Many of the problems arise from East European and other 'ethnic' processed foods with the absence of labelling in English or Irish, with Quantitative Ingredients Declaration (QUID) labelling deficiencies, and from issues in relation to the labelling of foodstuffs with nutritional and/or health claims that are not permitted under the terms of Regulation 1924/2006.

2.6 Complaint Samples.

Complaint samples arise when consumers find contamination, infestation, spoilage, extraneous matter or other defects in foods. Some complaints arise from food poisoning incidents (these samples are tested primarily in the Food Microbiology laboratories, but also may require chemical testing). Complaint samples processed in this laboratory usually involve the presence of foreign bodies such as plastic, glass, metal, insects, hairs/fibres, plant 'debris', general dirt/unidentified material or abnormal odours/tastes in food.

A total of 126 complaint samples received from the EHO service (115) and directly from the public (11) was investigated here in 2008. Of the 126, the number of adverse reports issued was 69 (55%), -see Appendix 2 for a breakdown according to food category. The number of food complaints received in this laboratory has decreased considerably from a steady average of ca. 230 per annum (1999-2003) to an average of 126 (2006 – 2008). It is not clear why this reduction has occurred. One possible factor is better handling of complaints by retailers.



2.7 Food Alerts (RASFF) and Hazard/Contamination Reports.

The EU Rapid Alert System for Food and Feed (RASFF) is activated when a member state reports significant contamination/risk associated with a batch of food or feed. The EU Commission has produced a report on 2008 RASFF Notifications, giving detailed breakdowns of category of food, nature of risk/hazard, origin of food, country of origin of alert etc, see http://ec.europa.eu/food/food/rapidalert/report2008_en.pdf. A short summary of the 2008 Notifications by Hazard group is given below:

Hazard/Risk Group	Number of Notifications (2008)
Food: Chemical and Physical Hazards[1]	2233
Food: Microbiological Hazards[2]	524
Food: Other Hazards/Risks[3]	357
Animal Feedstuffs Hazards[4]	18

1 Mycotoxins, Heavy Metals, Pesticides and Veterinary Residues, Additives, Allergens, Biotoxins (others), Chemical Contamination, Industrial Contaminants, Radiation, GMOs, Foreign Bodies, Migration, Composition etc.

2 (Potentially) Pathogenic Micro-Organisims, TSEs and Microbiological Contamination.

3 Insufficient controls, Unauthorised production, Absent Labelling etc, Defective Packaging, Biocontaminants, Organoleptics Aspects, Parasitic Infestations, Others.

4 All Hazards notified for Animal Feedstuffs.

Food Hazard/Contamination Reports are issued by the laboratory when contamination deemed significant is detected. Upon consideration by FSAI, a Food Alert notification may be issued (to EU member states) depending on their evaluation of the risk. In 2008, 7 Food Hazard/Contamination Reports were issued by the laboratory, relating to: undeclared Sulphur Dioxide in apricots (2) & in wine (2), Aflatoxin B_1 in basmati rice (1), Fumonisin B_1 & B_2 in maize meal (1) & mould in an orange drink (1).

The decrease in issued Hazard/Contamination reports is due largely to the large decrease in detected contamination with Aflatoxins and Benzo-[a]-pyrene.

A summary of the total number of Food Hazard/Contamination Reports issued to-date are outlined below.

2.8 Previous Years' Results.

Annual food surveillance results from this lab are summarised by year in Appendix 4.

Number of Food Hazard/Contamination Reports Issued								
2008	2007	2006	2005	2004	2003	2002	2001	2000
7	24	26	23	16	16	19	43	31

3. WATERS / EFFLUENTS

3.1 Introduction.

The laboratory provides a water testing service to Local Authorities, the general public, local industry and hospitals in the region.

Most of the samples received are drinking waters, which are tested for compliance with the European Communities (Drinking Water) Regulations 2007, S.I. 278 of 2007.

Up to 25 different chemical parameters may be analysed. Summaries of the results for selected parameters are shown below.

Bathing water samples are tested for compliance with the Quality of Bathing Water Regulations 1992, S.I. No. 155 of 1992.

Effluents, pool waters and water samples from hospital haemodialysis units are also analysed.

3.2 Sample Sources 2008.

The samples received by the laboratory were from the following sources:

Source	Number
Galway (HSE)	3435
Galway County Council	174
Galway City Council	916
Mayo	1598
Roscommon	254
Donegal	1172
Sligo/Leitrim	936
North Tipperary	719
Clare	440
Limerick	587
Haemodialysis (Hospitals)	341
Private Lead analysis (drinking water)	351
Miscellaneous	932
TOTAL	**11,855**

3.3 Fluoridation of Public Water Supplies.

Fluoride has been added to Public Water Supplies in Ireland since the 1960s as a means of improving dental health. Up to 2007, the required level of Fluoride was

0.8mg/L to 1.0mg/L.

The Fluoridation of Water Supplies Regulations 2007, S.I. No. 42 of 2007, specifies a lower concentration range of 0.6mg/L to 0.8mg/L Fluoride.

The Regulations also require that water supplies to which Fluoride has been added shall be monitored for Fluoride at intervals not exceeding one calendar month.

This laboratory carries out the official monthly testing on water supplies in the region, the results for which are recorded in Appendix 5.

3.4 Lead in the Galway Public Water Supply.

The toxic nature of Lead has been known for a very long time. Lead affects the developing nervous system and intellectual and behavioural developments. Consequently, foetuses and children under six years of age are most at risk.

Lead is widespread in the environment and can be found in older homes with leaded paint, and in soil, plumbing materials and elsewhere.

When Lead is found in Drinking Water, the source is most likely to be from Lead solders and pipes in the water distribution system. The practise of using Lead pipes and solders was discontinued in the 1970s. Lead piping may consist of three components:

(i) Lead mains, which is the responsibility of the Local Authority;

(ii) Lead connection from the mains to the Stop Valve, which is the responsibility of the Local Authority;

(iii) Lead connection from the Stop Valve to the

householder's tap, which is the responsibility of the householder.

The distribution system serving many older houses may still retain some lead components, which can leach into the drinking water.

Factors affecting the extent to which this may happen include the following:

- The corrosive tendency of the water. Water with a low pH (acidic) will dissolve Lead pipes and solders much more so than water with a high pH (alkaline), and result in significant concentrations of Lead in the Drinking Water.
- The amount of Lead piping in contact with the water. In many cases, some of the Lead piping will have been replaced.
- The length of time that the water is in contact with the Lead piping. The longer the contact time, the higher the concentration of Lead in the water. The Lead level is usually highest in the morning due to the water "sitting" overnight. Discarding the first flush of water in the morning was a traditional practice in areas with known Lead piping.

The current limit for Lead in Drinking Water is 25µg/L Pb. This level will be reduced to 10µg/L Pb in 2013. Samples of water tested by this laboratory during the summer of 2008 revealed elevated levels of Lead in some areas of Galway City. Follow-up testing indicated that the suburban area of Mervue was most affected.

It transpired that some parts of Mervue were still serviced by a Lead mains supply unlike the rest of the city, where these pipes had been replaced over the years.

Blood Lead level analysis (not conducted by this laboratory) from 35 people who had experienced high levels of Lead in their Drinking Water indicated normal results. These results were very welcome and provided reassurance that the high Drinking Water Lead levels did not seem to have a clinical manifestation.

The discovery of high Lead levels resulted in restrictions being placed on drinking the affected water, particularly for young children and expectant mothers.

It also resulted in additional requests for Lead testing from Galway City Council and other Local Authority areas as well as from concerned members of the public. The total number of samples analysed by the laboratory specifically for Lead as a result of this episode was 1102.

Some of the measures taken to reduce exposure to Lead included running to waste the first flush of water, in the morning or after a period of disuse, and adjustment of the pH of the water by the Local Authority at the treatment works in order to reduce the degree of leaching.

The ultimate solution is the removal of the Lead pipes from the distribution system.

A program for removing the Lead mains from the system in the Mervue area is underway currently.

3.5 Trihalomethanes.

Trihalomethanes occur in drinking water as a result of the reaction between the added chlorine and organic matter, which may be present naturally in the water. Total Trihalomethanes include Chloroform, Bromodichloromethane, Dibromochloromethane, and Bromoform.

Chloroform is classified as a possible human carcinogen. The limit for Total Trihalomethanes was reduced from 150µg/L to 100µg/L on 25th of Dec. 2008.

A summary of results for 2008 is shown in the table below. The high results can be attributed to a small number of water supplies.

Trihalomethane Results	Numbers of Analytical Results Expressed in Ranges (µg/L)						
Concentration Range	≤10	11 - 50	51 - 100	101 - 150	151-200	201-300	>300
Number of Samples	272	718	379	110	91	10	4

3.6 Aluminium.

Aluminium salts are employed in a flocculation process at some water treatment plants as a means of reducing the amount of suspended and colloidal matter. The Aluminium is subsequently removed, but traces may persist in the final water.

While the benefit of this process is partly aesthetic, it also serves to reduce the number of Cryptosporidium Oocytes and the amount of organic matter that may be present. The reduced organic matter will result in the formation of lower Trihalomethane levels after chlorination.

The current limit for Aluminium in Drinking Water is 200 µg/L Al.

The table below shows a summary of the results for 2008. This table includes some results for untreated water samples to which Aluminium was not added.

Aluminium in Public Supplies	Results in µg/L.			
Concentration Range	≤20	21–200	201–1000	>1000
No. of Samples	3201	2595	278	51

3.7 Arsenic.

Inorganic Arsenic compounds are classified in Group 1 (carcinogenic to humans) by the International Agency for Research on Cancer.

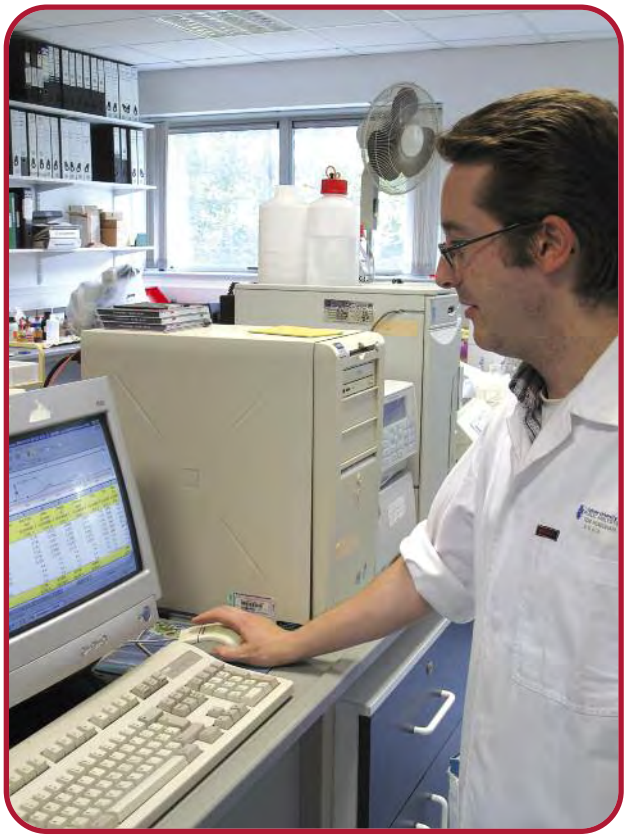
Consequently Arsenic is included in the test suite for all private drinking water samples as well as relevant public water supplies.

Arsenic may be present as a result of industrial activity. However, it also occurs naturally as a result of dissolution of minerals and ores. Where elevated levels are recorded, it is normally in specific geographic areas where these ores and minerals are present.

The current limit for Arsenic in Drinking Water is 10µg/L As.

The results for the year 2008 are summarised below. The raised levels recorded were found in private supplies.

Arsenic Results (µg/L As)			
Concentration Range	≤10	>10 - 50	51-100
Number of Samples	1978	45	4



3.8. Haemodialysis Water.

Haemodialysis units operate water treatment systems to produce purified water for use in Dialysis machines. The laboratory performs a chemical analysis on these samples. The number tested during the year was 341.

3.9 Private Samples.

The number of samples tested for private individuals in 2008 was 933.

4. ENVIRONMENTAL

4.1 Air Pollution Monitoring.

Air quality in Ireland is controlled by a series of Regulations.

The "Air Quality Standards Regulations 2002" (S.I. 271 of 2002) sets standards for Sulphur Dioxide, Nitrogen Dioxide and oxides of Nitrogen, particulate matter PM_{10}, Lead, Benzene and Carbon Monoxide.

Further regulations deal with Ozone in ambient air, Heavy metals and Polycyclic Aromatic Hydrocarbons.
An air pollution monitoring service for the analysis of Sulphur Dioxide, Black Smoke and PM_{10} is performed by the laboratory on behalf of Galway City Council.
Sampling is conducted at two monitoring sites in the city, namely Bodkin Roundabout (adjacent to Currys) and Terryland Waterworks.

Air pollution data recorded by the laboratory is returned to, and published by the EPA.

The country is divided into four zones for the purposes of assessment and management of air quality.
Galway is in zone C of the country. This zone comprises of Galway City, Limerick City, Waterford City along with 18 other towns and urban areas around the country.

4.1.1 Sulphur Dioxide.

Sulphur Dioxide (SO_2) enters the air from both anthropogenic (i.e. from human activities) and the natural environment. Exposure to high levels of SO_2 can lead to respiratory problems and damage to vegetation. It is one of the main precursors of acid rain.

The Air Quality Regulations require one SO_2 monitor in Zone C. The EPA operates a mobile monitoring unit for this parameter in this zone. This laboratory has monitored for SO_2 in Galway City for many years and continues to do so at two locations.

The results of the monitoring for 2008 are shown in Appendix 6.
The daily limit value set for the protection of public health is 125µg/m³.

The values found in 2008 are very low, with no exceedances at any time during the year.

4.1.2 Black Smoke.

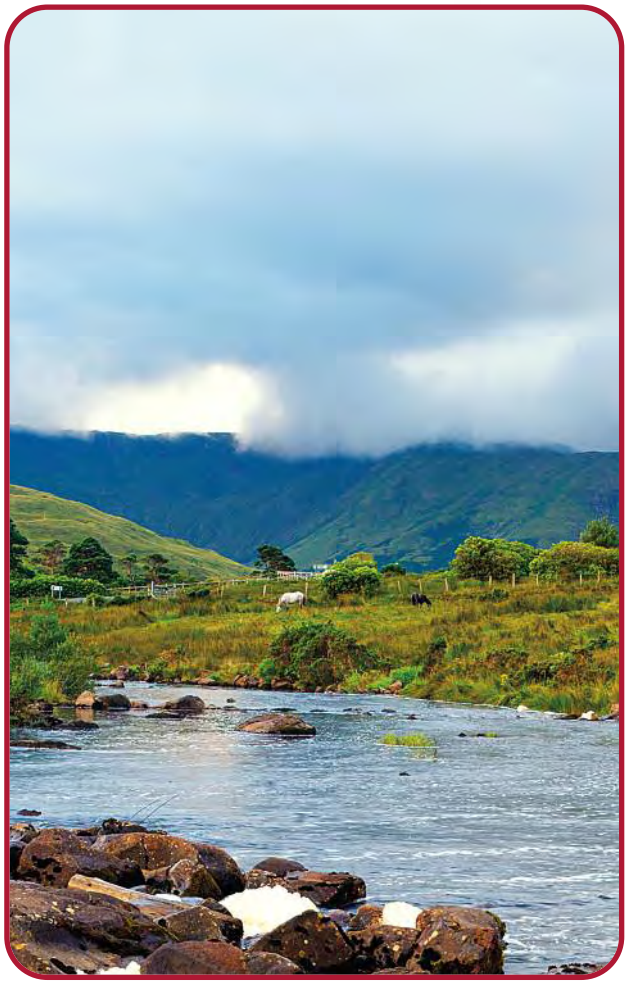
Black Smoke is measured at both monitoring sites in Galway City. Although there is no legislative requirement (since Jan 2005) to monitor for this, it is worthwhile to continue the monitoring, given the large amount of data obtained by the laboratory over many years. This facilitates the observation of trends over a long period of time.

The monthly average along with the lowest and highest recorded values are shown in Appendix 6.

4.1.3 PM_{10}

PM_{10} is the term used to describe particulate matter which is 10µm or less in diameter. These particles may consist of a complex mixture of soot, organic and inorganic matter. There are many sources of PM_{10}, which include the combustion of diesel and solid fuels and dust from road traffic.

Concern about PM_{10} levels relate to the respiratory problems caused by their inhalation.



The Air Quality Regulations require monitoring at two locations in Zone C. The EPA operates one such monitoring unit in a mobile facility. The other monitoring unit is operated by this laboratory at the Bodkin roundabout monitoring station.

The Regulations set a 24-hour average limit of 50µg/m^3 which is not to be exceeded more than 35 times a calendar year, and a yearly average limit of 40µg/m^3 for PM_{10}.

The 24-hour average limit was exceeded 6 times during the year. The highest value recorded was 86µg/m^3.
The average daily value for the year was 16µg/m^3.
The results for the year 2008 are shown in Appendix 6.

5. PHARMACEUTICAL LABORATORY

Service to the Irish Medicines Board (www.imb.ie)

The function of the Irish Medicines Board (IMB) is to protect and enhance public and animal health through the regulation of human and veterinary medicines and medical devices available for sale or manufactured in Ireland and to participate in systems designed to do the same throughout the EU.

Since 1976 this laboratory has provided an analytical service to the Irish Medicines Board (IMB), formerly the "National Drugs Advisory Board", to test drug products and medicines as well as providing technical advice and support related to the testing of medicines.

In this regard, the Pharmaceutical Section of the Public Analyst's Laboratory, Galway has been appointed an **Official Medicines Control Laboratory (OMCL)** under the framework of the European Directorate for the Quality of Medicines and Healthcare (EDQM) and the Council of Europe.

Role as an Official Medicines Control Laboratory (OMCL)

At a National level, the laboratory contributes to the protection of public health and the regulatory function of the IMB by providing independent analytical data and technical advice on medicinal products that enable the IMB to make informed decisions on the quality and the compliance status of medicines.

At a European level, the laboratory actively participates in activities of the OMCL Network (collaboration between regulatory medicine-testing laboratories designed to improve communication, enhance cooperation and to harmonise methods of work across the EU and other states). These activities include the testing of Centrally Authorised Medicinal Products (CAP), the testing of Mutually Recognised/Decentralised Products (MRP/DCPs), and participation in Proficiency Testing Studies (PTS). (for more information see www.edqm.eu, Control of Medicines Section).

Sampling and Analysis

119 pharmaceutical and 50 cosmetic samples were received during 2008, broken down as follows;

Irish Medicines Board (Finished Products)	30
Irish Medicines Board	
(Active Pharmaceutical Ingredients)	72
EDQM – Centrally Authorised Products	7
Proficiency Tests (EDQM & Pharmassure)	10
Cosmetics for Hydroquinone*	49
Cosmetic for pH	1

*See Cosmetics Testing, Section 6.

In 2008, Certificates of Analysis were issued for 50 cosmetic samples and 64 pharmaceutical samples consisting of medicinal finished products (capsules, tablets, suspensions etc.), as well as active pharmaceutical ingredients sampled by IMB inspectors at manufacturing sites. Testing of Pharmaceuticals was carried out according to the monographs of the European Pharmacopoeia, the British Pharmacopoeia, the United States Pharmacopoeia and/or company methods. A wide variety of tests was carried out on each sample which may include; Appearance Testing, Uniformity of Mass, pH, Identification and Assay by HPLC, Identification and Assay by UV-Vis, Uniformity of Content, Dissolution, Assay by Titrimetry, Water Determination by Karl Fischer, Loss on Drying, Identification by IR, Identification by TLC, Specific Optical Rotation, Melting Point, Specific Gravity, Related Substances by HPLC, etc.

As is evident from the number of reports issued vs. the number of samples received, there is a backlog of samples for testing. This is due to a continued shortage of staff working in this area.

Quality System

To ensure quality and comparability of results within the Network, OMCLs must operate to a quality system based on ISO/IEC 17025. The laboratory also operates to guidelines issued by the EDQM-OMCL Network and accepted by the EA (European Accreditation Co-operation) on a range of topics including;

- Validation of Analytical Procedures

- Evaluation & Reporting of Results
- Qualification of Equipment including HPLC, GC, UV-Visible and IR Spectrophotometers and Automatic Titrators (see www.edqm.eu for more information)

The Pharmaceutical Laboratory was successfully inspected by the Irish Medicines Board to ISO17025 and the applicable OMCL Network guidelines in April 2008.

Proficiency Testing Schemes

The laboratory successfully took part in EDQM and Pharmassure-organised Proficiency Testing Schemes during 2008, covering the following areas: Assay and Identification by HPLC, Dissolution, Related Substances by HPLC, pH, Density, Melting Point.

Attendances

One member of staff attended the Annual Meeting of the EDQM European Network of OMCLs held in Strasbourg in June 2008, funded by the Irish Medicines Board.

5.1 TOXICOLOGY LABORATORY

A basic toxicology service is offered, mainly to the Consultant Pathologists and Physicians in HSE West as well as to Veterinary Surgeons and members of the public.

The total number of samples tested during 2008 was 202, made up as follows:

Ethanol (Post Mortem)	107
Ethanol (Road Traffic Act)	32
Proficiency Tests	60
Strychnine	1
Miscellaneous samples for Ethanol	2

Blood and urine samples "B-samples" taken under the Road Traffic Act are independently analysed for alcohol. The number of such samples tested during 2008 was 32, of which 84% were above the legal limit.

Quality System

The laboratory takes part in an External Quality Assessment Scheme (UKNEQAS) organized by Cardiff Bioanalytical Services Ltd. Samples of blood, serum and urine are received on a monthly basis and analysed for ethanol.

6. COSMETICS

6.1 Cosmetics Legislation.

The EU retail market value for cosmetic products has been estimated at 65 billion euro (EUROSTAT data for 2004). Such a market requires controlling legislation. EU Council Directive 76/768/EEC (and amendments), governs the marketing and safety of cosmetics in the EU. In Ireland the European Communities (Cosmetics Products) Regulations – S.I. No. 870/2004, gives effect to the EU Legislation. The Minister for Health and Children is the competent authority for the Regulations, a function which is currently being negotiated for transfer to the Irish Medicines Board.

The Regulations set out standards which must be complied with by the Cosmetics Industry, and also prescribes enforcement mechanisms and penalties. Schedule 2 of the Regulations lists 1,132 prohibited compounds and groups of compounds. Schedules 3 to 7 set restrictions on the use of an extensive range of specified permitted ingredients, additives etc. The Scientific Committee on Consumer Products (SCCP) advises the EU Commission on issues related to the safety of cosmetics and cosmetics' ingredients.

At EU level, the cosmetics Directive and its many amendments etc are currently being consolidated.

6.2 Enforcement of Cosmetics Legislation in HSE.

Within HSE the Environmental Health Officers (EHOs) and the Public Analysts' Laboratories are respectively the authorised officers and official analysts for the Regulations.

RAPEX, is the EU rapid-alert system for notifying hazards/risks associated with Consumer Products (toys, electrical devices, vehicles, cosmetics etc), excluding Foods, Waters, Medicines & Medical Devices http://ec.europa.eu/consumers/safety/rapex/docs/rapex_annualreport2008_en.pdf. In Ireland the National Consumer Authority (NCA) administers RAPEX www.consumerconnect.ie.

A Cosmetics Control Group has been set up in the HSE. The group has produced reports summarising the present level of official cosmetics enforcement/control (inspection, surveillance etc) in Ireland, and has made

Table 7: Lead and Cadmium Results for Cosmetics 2008

Lead (Pb)		Cadmium (Cd)	
Results Range (mg/kg)	No. of Subsamples	Results Range (mg/kg)	No. of Subsamples
<1.0	360	<0.10	653
1.0 – 5.0	256	0.10 – 1.0	63
5.1 – 10.0	36	1.1 -5.0	27
10.1 - 20.0	34	5.1 – 10.0	9
20.1 - 100	31	10.1 - 100	9
101 - 1000	15	>100	1
1001 - 5000	21	*Composite <1.5	36
>5000	10		
*Composite <20.0	35		
Total	**798**	**Total**	**798**

*Composite samples consist of a number of subsamples combined and analysed as a composite. The results figure represents the maximum concentration of any one of the subsamples.

recommendations on procedures and resourcing in this area.

Much of the official testing of cosmetics performed to date in Ireland has resulted from responses to RAPEX alerts, although targeted surveillance has increased.

This laboratory in co-operation with the Cork Public Analyst's Laboratory and the Environmental Health Service has put in place a national cosmetics' testing programme for the year 2009.

This programme is necessarily limited in scope due to the limited resources available.

6.3 Results for 2008.

6.3.1 Heavy Metals:

Table 7 above summarises the overall results for all cosmetics tested here for Lead (Pb) and Cadmium (Cd) in 2008.

162 samples were tested. Most samples consisted of multi-component sets of different cosmetics types (e.g. powders and lipsticks) and colours, and in most cases each component required analysis. Overall 798 components (sub-samples) were tested.

The data above includes follow-up testing of a cheaper-brand, children's cosmetic tested in 2007. Results from products of the same brand showed gross levels of Lead in some products, concentrations reaching up to 10,000 mg/kg, i.e. 1% Lead. The results indicate the use of industrial Lead compounds (i.e. prohibited compounds) as ingredients, probably as colours.

There are no specific limits set for Heavy Metals in the Cosmetics Directive or Regulations. However Lead and its compounds are prohibited to be present in cosmetics (Cosmetics Regulations – S.I. No. 870/2004, Annex 2, entry 289), unless present in traces which are "…technically unavoidable in the context of good manufacturing practice…" (8.(2)), and not "…liable to cause damage to human health…" (7.(1)). Based on toxicological/technological advice received by HSE, a limit of 10 mg/kg was initially used as an upper limit for Lead in cosmetics. A recent risk analysis by the German cosmetics authorities (performed by BfR) indicated that 20 mg/kg to be a level of Lead which complies with the legislative criteria. As it appears that several EU member states now use this upper limit, 20mg/kg was adopted as an interim measure for official control purposes within the HSE.

In 2008, 111 components exceeded a Lead level of 10 mg/kg, of which 77 exceeded the adopted limit of 20 mg/kg. The laboratory issued 18 Cosmetics Hazard/Contamination Reports, concerning a total of 23 samples, to the EHO service. The results were forwarded to the NCA and Dept. of Health and Children for notification through RAPEX.

19 sub-samples contained Cadmium levels greater than 5 mg/kg, the limit set by Germany/ BfR.

The above Lead and Cadmium data include a targeted, local (Co. Galway EHS) survey of 103 samples (444 components) of low priced/ 'Discount Stores' cosmetics undertaken in early 2008. 29 of the 444 components tested exceeded the Lead limit of 20mg/kg.

The data from Table 7 indicate that the majority of the tested sample components (616/798, i.e. 77%) contained Lead levels of less than 5 mg/kg. The results show that cosmetics' manufacturers can and generally do achieve Lead levels of less than 5 mg/kg, and that 5 mg/kg (or a lower figure) may be considered as an appropriate upper limit for Lead in cosmetics (based on "... good manufacturing practice.."). Similarly, the majority (653/798, i.e. 82%) of components contain Cadmium at less than 0.1mg/kg.

It is hoped that the data can be used by the EU Commission to review the upper limit for Lead and Cadmium in cosmetics. It would be useful to have EU-wide legislative limits. In the meantime, for consistency of application, the BfR Lead limit remains in place as an interim measure.

No Mercury was detected in any of the 9 samples tested for Mercury (all < 0.25 mg/kg).

The issue of dealing with cosmetic products with excessive heavy metals (those in breach of the legislation) is one of legislative enforcement, which may result in a range of actions from HSE(EHOs) and/or DoH/C, NCA, including trade withdrawal etc. However, the legislation does not cover cosmetics already purchased by consumers. In 2008, a Cosmetics Steering Group was formed within HSE (Population Health/PCCC) to examine the risk to human health from (expected) use of cosmetic products contaminated with high levels of heavy metals, Lead in particular. Specifically, the circumstances in which a full product recall (including already purchased cosmetics) may be required, are being examined.

6.3.2 Hydroquinone in Creams etc.

Hydroquinone products are popular for their skin-lightening properties in Asian and African cosmetics markets, and are often found in cosmetic products sold in 'Ethnic' shops. These products are generally topical in nature (e.g. creams, oils, lotions), applied to lighten areas of darkened skin and localised blemishes such as freckles, chloasma (also known as melasma), age spots, and acne scars.

Under EU legislation, hydroquinone is permitted only as (a) an oxidising hair colouring agent, for professional use only, at a maximum level of 0.3% and (b) in artificial nail systems, for professional use only, up to 0.02%.

Due to fears about its safety, Hydroquinone (at any level) is prohibited, by law, for use in eyelash/eyebrow dye or as a skin-lightening agent.

During 2008 forty nine samples were submitted for testing having been sampled from Ethnic shops around the country by EHOs. Twenty three samples (47%) tested positive for hydroquinone, up to a maximum concentration of 4.9%.

Hydroquinone concentration	No. of samples
0.01 – 2.0 %	4
2.1 – 3.0 %	2
3.1 – 4.0 %	3
4.1 – 5.0 %	14

Six RAPEX alerts were issued from Ireland in 2008 regarding products found to contain hydroquinone. Two of these arose from samples tested during 2007, two from samples tested in 2008 and two for products where the label stated that the product contained hydroquinone.

6.3.3 Para-Phenylenediamine in Hair Dyes.

Arising from several RAPEX alerts, samples of hair dye were received here for testing for para-phenylenediamine, a conditionally permitted hair colourant with an upper limit of 6%. A method of analysis was introduced and 3 samples were tested in 2008. Results ranged from 11.6 to 15.8% para-phenylenediamine. The results were considered as being in compliance as the products were intended for dilution (bringing the concentrations down to below 6%) before use. Further surveillance is programmed for 2009.

6.3.4 Diethylene glycol in Toothpastes.

Arising from a RAPEX Alert, a method for diethylene glycol was developed in this laboratory in 2008. Two samples of toothpaste were tested for diethylene glycol (DEG). Neither sample contained DEG.
Surveillance of toothpastes on the market is programmed for 2009.

6.3.5 Irradiation of Cosmetics.

101 samples were tested for irradiation using a screening method (PPSL). Samples are designated as positive, intermediate or negative. The following results were obtained: 9 samples "positive"; 20 samples "Intermediate": 72 samples "negative". 2 of the "positive" samples were sent for confirmatory testing (SUERC, Scotland, TL method), both of which were confirmed as positive. The cosmetics legislation does not deal with irradiation of cosmetics*. The results were forwarded to the competent authority to obtain an opinion from the EU Commission.

*In contrast, the irradiation of certain food groups is permitted and such irradiation must be declared on the food's label.

6.3.6 Labelling of Cosmetics.

10 samples were examined in 2008 for compliance with the labelling requirements in the Cosmetics Regulations (S.I. No. 870 of 2004). 5 samples were found to be non-compliant.

6.3.7 Other Cosmetics' Testing.

3 samples of mouthwash were tested compositionally (conductivity, alcoholic strength, pH etc) in connection with a consumer complaint. One other sample was tested for pH.

6.3.8 Overall Summary and Recommendations.

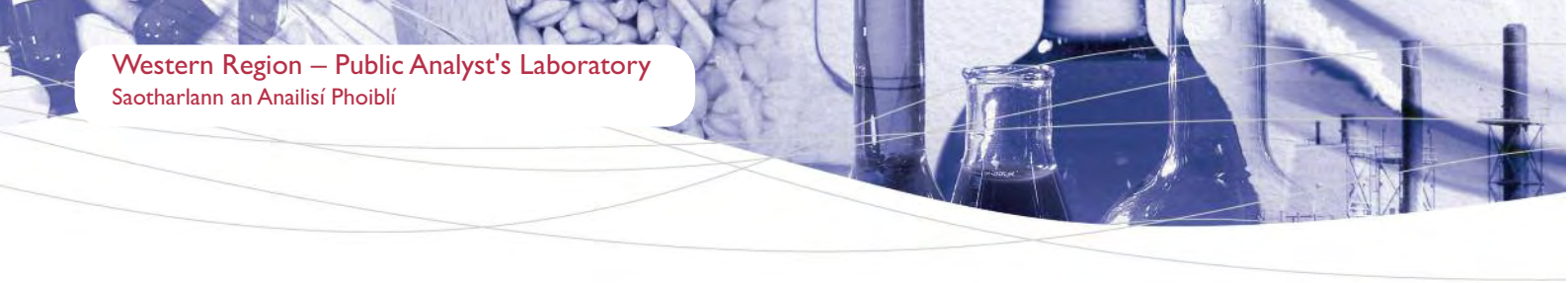
Summary

The quality of many 'cheaper-brand'/low-cost cosmetics entering this country, from China in particular, is unsatisfactory. A number of children's cosmetics products have been found to be contaminated, primarily with Lead. The levels of Lead (up to 10,000 mg/kg, i.e. 1%) represent an unacceptable hazard to consumers. Whilst some forms of Lead, e.g. Lead Sulphide, are generally considered to present a low risk, the actual risks to human health from use of the Lead-contaminated products described above are not known. This is true largely because we do not know the detailed form (exact compound, oxidation state, solubility, particle size (e.g. nano or standard) etc) of Lead present.
The results indicate that in some cases Lead compounds are being used as ingredients (colours) in some cosmetics, despite the fact that even trace residues are prohibited by the legislation. Such a lack of Quality Assurance at manufacturing level is of concern and it suggests a possible risk of other, more serious hazards arising.

To date there has been less official testing of 'higher-brand', more reputable cosmetics from pharmacies, large retailers etc. Increased surveillance is anticipated from 2009 onwards.

Recommendations etc.

Sampling and analysis of cosmetics will not of themselves solve the current problems of contamination of the



cheaper, imported cosmetics. New structures for the organisation and co-ordination of official control of cosmetics are being put in place at national level. Some of the issues which require addressing are:

- National Co-ordination of Enforcement, including RAPEX administration, with resourcing proportionate to the risks;
- Improved Surveillance, including moving control further up the supply chain (i.e. to importers, wholesalers, manufacturers etc);
- **In particular the cosmetics trade (importers, wholesalers, retailers and manufacturers) should be fully aware of their responsibilities to ensure that their produce complies with the law.**
- A system of mandatory certification of imported cosmetics should be considered, in alignment with current legislation.
- The need for consistent, official cosmetics control in EU member states, in particular with respect to control of cheaper imports.

Laboratory resources for Cosmetics testing are minimal, with staff having to be diverted from other areas within the service to cover Alert samples etc.

7. MISCELLANEOUS TESTING

- In connection with an investigation concerning a child with elevated blood Lead, 5 paint samples, 1 scale and 1 dust sample were tested for Lead.
- 12 samples of human hair, 8 samples of yeast, 2 samples of "reaction residues" and 1 sample of blood were tested for a range of heavy metals.
- 3 syrups were tested for gluten.
- 11 other samples submitted for testing/identification in 2008 include an iron deposit, an algal pellicle, plastic, paste, process water, under-floor water, mould, hand cream, sulphuric acid and stone.

8. LABORATORY ACCREDITATION

8.1 Accreditation.

Accreditation is a formal recognition of a laboratory's competence to carry out specific tests or types of tests. This recognition is based on compliance with a series of International and European Standards. Accreditation gives customers of a laboratory confidence, through ensuring consistently high standards in the quality of the service.

Member states of the EU have established a network of national accreditation bodies which seeks to ensure that the competence of all laboratories are assessed to the same principles.

In Ireland, the Irish National Accreditation Board (INAB) is the body with responsibility for awarding accreditation, in accordance with the relevant ISO 17000 series of standards and guides. The current relevant standard for this laboratory is ISO/IEC 17025 'General requirements for the competence of testing and calibration laboratories'. The standard contains detailed requirements for both the management of laboratory operations and technical aspects such as method validation, measurement traceability and measurement uncertainty.

Over the past 19 years, this laboratory has continuously added to its list of accredited tests, and now is accredited for a wide range of analytes, using a variety of testing procedures in Water, Food and Pharmaceuticals products. A full list of our accredited tests is available on the INAB website http://inab.ie/directoryofaccreditedbodies/laboratoryaccreditationtesting/009T.pdf.

INAB Surveillance Visit.

The laboratory receives regular surveillance and re-assessment visits from INAB. Their purpose is to determine whether a laboratory is continuing to comply with the ISO/IEC 17025 and INAB Regulations. In 2008, our annual INAB surveillance visit took place in October. We were successful in achieving accreditation for a number of test methods involving new analytical techniques for this laboratory, including analysis of trace metals in water by Inductively Coupled Mass Spectroscopy (ICP-MS), and Volatile Organic Compounds in water using Gas Chromatography Mass Spectroscopy (GC-MS).

In the food section of our laboratory, we were awarded a flexible scope for certain testing involving the High Performance Liquid Chromatography (HPLC) technique. Flexible scopes allow a laboratory to undertake certain tests and to claim accreditation for this test even though those tests may not be explicitly stated on their scope of accreditation. The laboratory now has flexibility regarding the range and matrix for a number of previously accredited HPLC tests.

In addition we were successful in maintaining accreditation for our existing scope.

8.2 Proficiency Testing.

As part of our external quality control, the laboratory participates in a range of international proficiency testing schemes. These schemes involve receiving and analysing test samples with unknown concentrations of analyte. The results are submitted to the scheme organisers who then inform the laboratory how they have performed in the scheme.

In 2008 we participated in a large number of proficiency testing rounds, covering a wide range of parameters and analytical procedures (see table on page 27). The results are monitored and to date, our record in proficiency testing is very good. Any non-conformances are investigated and if necessary corrective actions are formulated and implemented.

Proficiency Testing Schemes – 2008

Scheme	Parameters Tested
FAPAS	**Nutritional Components** - Nitrogen, Moisture, Ash, Fat, Sodium
FAPAS	**Aflatoxins** – B_1, B_2, G_1, G_2, Total Aflatoxins
FAPAS	**Fumonisins** – B_1 and B_2
FAPAS	**Trace Elements** in food (Lead, Cadmium, Arsenic)
FAPAS	**Nitrate/Nitrite**
FAPAS	**Environmental Contaminants** – Benzo[a]pyrene
FAPAS	**3-MCPD**
FAPAS	**Allergens** – Histamine, Gluten, Sulphites
FAPAS	**Fruit Juice** – pH, Brix, Sodium
FAPAS	**Food Additives** – Sulphur Dioxide (Fruit slurry, meat, wine)
FAPAS	**Artificial Sweeteners** (Acesulfame K, Saccharin)
FAPAS	**Alcoholic Strength**
FAPAS	**Butterfat**
CHEK	**Sorbic Acid, Benzoic Acid, Sulphite** (wine)
CHEK	**Glutamic Acid**
Quasimeme	**Shellfish** – Domoic and Epi-domoic Acid, Okadaic Acid, DTX toxins
QDCS	**Dairy Products:** Acid Titration, Freezing Point Depression, Phosphatase, Antibiotics
FOBS	**Foreign Body Identification** (Foods)
AQUACHECK	**Water** – Alkalinity, Hardness, Colour, Turbidity, Conductivity, pH, Fluoride, Chlorine, **Food** – pH, **Pharmaceuticals** – pH
AQUACHECK	**Water** – Nitrate, Nitrite, TON, Ammonia
AQUACHECK	**Water** – Volatile Organic Compounds
AQUACHECK	**Water** – Aluminium, Arsenic, Boron, Cadmium, Chromium, Iron, Manganese, Copper, Lead, Nickel, Selenium, Zinc
EDQM	**Pharmaceutical Analysis** – Assay by HPLC, Dissolution Testing
LGC	**Pharmaceutical Analysis** – Dissolution Testing
LGC /Pharmassure	**Pharmaceutical Analysis** – pH, Melting Point, Density
UK NEQAS	**Alcohol** in Biological samples

9. STAFF TRAINING

Staff receive both internal and external training in the use of Analytical Methods and Instrumentation, Information and Communication Technology, Health and Safety, Dignity at Work, Personal Development Plans, First Aid and Quality Assurance etc.

Attendance at Seminars and Conferences on analytical and on general subjects pertaining to Food Safety also takes place.

In-house induction and HSE induction training is provided for all new staff. General management training has also been undertaken. Budgetary cuts have resulted in a reduction in staff training.

10. MEETINGS / COMMITTEES ETC

FSAI:

Liaison Meetings with Public Analysts Group;

Service Contracts Meetings with Western Area HSE;

Gluten Working Group;

EHO-PA Lab Liaison Group;

Molluscan Shellfish Safety Committee;

Inter-Agency Meetings on Food Control;

Legislation Committee (FSAI-Dept. of Health & Children…);

Folic Acid Implementation Group;

Scientific Sub-committee [Additives, Contaminants…];

Cross Agency Labelling Enforcement Working Group.

SAFEFOOD/HSE:

IT system for Laboratory Service.

SAFEFOOD Allergens Training Board.

HSE Regional Food Committee [HSE West].

HSE Cosmetics Control Group.

HSE Cosmetics Steering Group.

Zoonoses Committee [Western Region].

FLEP: European Food Law Enforcement Practitioners.

I.A.P.A.L.:

The Irish Association of Public Analysts' Laboratories.

Fluoridation Committee [HSE West.].

Chemistry Network of Accredited Laboratories:

Forum for Quality Managers from INAB Accredited Chemistry Laboratories.

Irish Mass Spectrometry Society.

Local Authority – HSE [Water monitoring, South Park].

Irish Medicines Board: Liaison Meetings.

EDQM European Network of Official Medicines Control Laboratories: Annual Meeting.

NSAI: Working group on the revision of Irish Standard 432 (I.S. 432:2009)

11. INFORMATION AND COMMUNICATION TECHNOLOGY (ICT)

The LabWare laboratory information management system (LIMS), funded nationally by *Safe*food, has been 'live' since 01 January 2007. The LIMS is in continuous use in the laboratory and is undergoing expansion and development as a result of funding provided by the Department of Finance and also as a result of user and administrator training courses funded by *Safe*food. This development has included the integration of various instruments, involved in water and pharmaceutical analysis, into the LIMS, enabling paperless transfer of results. In 2008 an electronic reporting link was set-up between the lab and the FSAI, using the government VPN (Virtual Private Network), whereby summaries of all relevant sample details and results are automatically created and sent to the FSAI for inclusion in a national database of food testing.

Appendix 1. Outline Summary of HSE Western Region Food Sampling/Analysis (Chemical) Programme for 2008

Jan 07 – 15		40 **Prawns, Shrimps, Crab & Dried Apricots** (SO_2)		
Jan 16 – 31	25 **Canned Sprats in oil & Dried/Smoked Catfish** (Benzo-(a)-pyrene)		40 **Rice All types, brown & white** (Pb/Cd/As)	40 **Miscellaneous Ethnic Foods from Ethnic Shops** (General examination & Labelling)
Feb. 1 – 15	60 **Miscellaneous Foods** (Sorbates/Benzoates)	ca 50 **Bottled Waters Local Production & Other samples** (Heavy Metals / Compositional/Labelling)		
Feb. 16 – 29	30 **Processed Nut Products** (Aflatoxins)	100 **F.S.A.I. Survey (s) Salt (Various Specified Foods)** (Na/K) (FSAI only)	**Method development/R&D** Development work throughout year	70 **Food Supplements** (Food irradiation)
Mar. 1 – 15			40 **Miscellaneous foods** (Colours/Sweeteners)	
Mar. 16 – 31	40 **Prawns, Shrimps, Crabs, Dried Tomatoes, Dried Fruits** (SO_2)		100 **Breads & Flours Folic Acid in Fortified Samples** (FSAI only)	10 **Molluscan Shellfish** (ASP Toxins)
Apr. 1 – 15	25 **Scombroid Fish etc** (Biogenic Amines)	20 **"Low-fat" Foods** (Fat ,General exam./ Labelling)		50 **Local Production foods Incl. Bakery Products** (General Examination/ Compositional/Labelling)
Apr. 16 – 30	15 **Maize Meals** 15 **Rice** (Aflatoxins/Fumonisins)	30 **Bottled Waters Local Production** (Heavy Metals/Compositional)	35 **"Gluten-free" Foods From Coeliac Society Book** (Gluten)	
May 1 – 15	25 **Canned Fish in Oil** (Benzo-[a]-Pyrene)	20 **Infant Formula Local Production and others** (Metals/Minerals/Compositional)	50 **Whiskey, gin, vodka** (Adulteration)	30 **Miscellaneous Foods With Labelled Health Claims** (Nutritional / Health Claims)
May 16 – 31	25 **Food Supplements** (Benzo-[a]-Pyrene)		40 **Wines, Beers, Packet Dehydrated Potatoes** (SO_2)	20 **Miscellaneous foods** (General Examination/ Compositional etc.)
June 1 – 15	30 **Oriental Foods Ready Meals, Soups, Sauces etc** (MSG)	30 **Ethnic Foods etc** (Heavy Metals etc)		
June 16 – 30	30 **Nuts, Dried Fruits, Peanut Butter, Nut-based confectionery** (Aflatoxins)		70 **Herbs, Spices,Seasonings, Packet Noodles, Food Supplements** (Food irradiation)	10 **Molluscan Shellfish** (ASPs/DSPs/AZAs)

Appendix 1. Outline Summary of HSE Western Region Food Sampling/Analysis (Chemical) Programme for 2008 (continued)

July 1 – 15	25 **Scombroid Fish etc** (Biogenic Amines)	30 **Food Supplements** (Heavy Metals, Labelling…)		50 **Dairy Products** (ALP, Inhib'y subs, Label etc)
July 16 - 31			40 **Cured Meats** (NO_2/NO_3)	60 **Miscellaneous foods** (Benzene)
Aug. 1 – 15	30 **Nuts, Fruit & Nuts, Peanut Butter, Figs** (Aflatoxins)	40 **Imported Fish and Shellfish** (Pb,Cd, Hg…)	100 (?) **Fortified Breads & Flours** (Folic Acid) FSAI only	60 **Raw Meats** (Anti-bacterial substances, EC Four-plate Test)
Aug. 16 – 31		40 **In-use Cooking Oils** (AV/DPTGs etc)		10 **Molluscan Shellfish** (DSPs, AZAs, ASPs.)
Sept. 1 – 15	60 **Ceramic Drinking Vessels** (Pb/Cd)		35 **"Gluten-free" Foods** (Gluten)	40 **Misc. Ethnic Foods from Ethnic Shops** (General examination / Labelling)
Sept. 16 – 30	25 **Scombroid Fish etc** (Biogenic Amines)	40 **Bottled Waters Local Production** (Heavy Metals/Compositional)	40 **Raw Sausages & Burgers, Minced Meats, Prawns, Shrimps, Crab** (SO_2)	70 **Food Supplements, Herbs, Spices, Seasonings, Packet Noodles, Dried Mushrooms/Seeds** (Food irradiation)
Oct. 1 - 15		50 **Miscellaneous Foods Tuna, Shark, Swordfish, Crab, Herbs and Spices** (Pb/Cd/Hg…)	50 **Miscellaneous Foods with Labelled Sodium (especially 'Low sodium' products)** (Na/Labelling etc)	
Oct. 16 – 31	30 **Wholesale/Distribution Nuts, Maize Meals, Dried Figs & Dates** (Aflatoxins)	100 **FSAI SURVEY(S)** **SALT (Specified Food Categories)** **(Na/K)** F.S.A.I. only		
Nov. 1 – 15	30 **Nut Products** (Aflatoxins)			70 **Herbs, Spices, Seasonings, Packet Noodles, Food Supplements** (Food irradiation)
Nov. 16 – 30	25 **Grapeseed Oil, Sunflower Oil, Husk Oil & Other Oils** (Benzo-[a]-Pyrene)	40 **Soy Sauces, Seasonings etc** (3-MCPD)	35 **"Gluten-free" Foods Local Bakery Products & Meat Products, also GF Foods from Pharmacies, Health Food Stores etc** (Gluten)	
Dec. 1 – 15		25 **Evening Primrose Oil+ Other Oil Supplements, Other Supplements** (Benzo-[a]-Pyrene)		
Dec. 16 – 31	**Non-routine samples only**	**Non-routine samples only**	**Non-routine samples only**	**Non-routine samples only**
Jan-Dec	• **Food Complaints, Food 'Alerts' etc., 'suspect' samples and tap waters from food premises (where relevant)** • **'Inspection' samples of Manufacturing / Processing etc premises when required**			

Appendix 2: Routine Official samples received from H.S.E. West, for the period from 01/01/2008 to 31/12/2008

Appendix 2: Food Complaint samples (from H.S.E. West & the Public) from 01/01/2008 to 31/12/2008

	Food Category	No. of Samples with Infringements		Chemical/ Physical Contamination		Compositional		Labelling (1) & Presentation		Other		No. Samples Received		% with infringements	
		Routine	Complaint	Routine	Complaint	Routine	Complaint	Routine	Complaint	Routine	Complaint	Routine	Complaint	Routine	Complaint
1	Dairy Products	9	5	0	3	0	2	9	0	0	0	83	6	10.84	83.33
2	Egg and Egg Products	0	0	0	0	0	0	0	0	0	0	1	0	0.00	0.00
3	Meat and Meat Products, Game and Poultry	24	11	0	8	9	3	15	0	0	0	175	16	13.17	68.75
4	Fish, Shellfish and Molluscs	17	0	2	0	0	0	15	0	0	0	297	4	5.72	0.00
5	Fats and Oils	2	0	0	0	0	0	2	0	0	0	57	0	3.51	0.00
6	Soups, Broths and Sauces	10	2	0	2	0	0	10	0	0	0	86	3	11.63	66.67
7	Cereals and Bakery Products	42	9	4	8	0	1	38	0	0	0	232	11	18.10	81.82
8	Fruit and Vegetables	8	5	0	5	0	0	8	0	0	0	115	6	6.96	83.33
9	Herbs and Spices	18	0	1	0	0	0	17	0	0	0	163	0	11.04	0.00
10	Non-Alcoholic Beverages	24	7	0	2	2	4	22	1	0	0	189	18	12.70	38.89
11	Wine	2	1	0	0	0	1	2	0	0	0	9	2	22.22	50.00
12	Alcoholic Beverages (Other than Wine)	1	0	0	0	1	0	0	0	0	0	42	5	2.38	0.00
13	Ices and Desserts	3	9	0	0	0	9	3	0	0	0	10	24	30.00	37.50
14	Cocoa and Cocoa Preparations, Coffee and Tea	3	0	0	0	0	0	3	0	0	0	4	0	75.00	0.00
15	Confectionery	9	3	0	3	0	0	9	0	0	0	57	3	15.79	100.00
16	Nuts and Nut Products, Snacks	4	2	0	1	0	1	4	0	0	0	114	2	3.51	100.00
17	Prepared Dishes	3	4	0	4	1	0	2	0	0	0	36	9	8.33	44.44
18	Foodstuffs Intended For Special Nutritional Uses	1	3	0	2	0	1	1	0	0	0	31	5	3.23	60.00
19	Additives	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00
20	Materials & Articles Intended to come into contact with Foodstuffs	0	1	0	1	0	0	0	0	0	0	47	2	0.00	50.00
21	Others	5	7	0	5	0	2	5	0	0	0	168	10	2.98	70.00
	Totals	**185**	**69**	**7**	**44**	**13**	**24**	**165**	**1**	**0**	**0**	**1916**	**126**	**9.66**	**54.76**

Note: (1) Refers to labelling infringements under the Health Legislation only

Appendix 3: Outline of Principal Official Surveillance of Foodstuffs in Ireland (RoI).

Department/Agency.....	Principal Food Categories	Principal Sampling Stage(s)	Principal Sampling Officers	Principal Official Laboratories*	Test Parameters and Groups
Department of Agriculture, Food and Rural Development	Animal-origin Foods (Meats etc) Fruit/Vegetables etc Milk/Dairy etc	'Production' Meat Plants, Farms etc Dairy Plants etc	Veterinary Officers & Agricultural Officers etc	Meat Control Laboratory National Food Centre Labs State Laboratory Pesticides Laboratory Dairy Science Labs	Microbiology & Veterinary Residues, Contaminants etc. Pesticides Microbiology, Residues etc
Dept. of Communications, Marine & Natural Resources	Fish, Shellfish etc	'Production' Fishing Boats, Processing plants, Fish Farms etc	Sea Fishery Officers etc (Sea Fisheries Protection Authority)	Marine Institute (also BIM Lab)	Microbiology (incl. virology), Marine Biotoxins, Residues & Contaminants etc
Health Services Executive (HSE)	All foodstuffs, including Food Contact Materials	All stages Retail, Catering Manufacturing etc	Environmental Health Officers	HSE Food Microbiology Labs & Public Analyst's Labs *Note 1.*	Microbiology, Contaminants, Compositional, Nutritional, Labelling etc
Local Authorities	Meat, Dairy…	'Production' etc	Veterinary Officers etc	Local Authority Labs, Dept. of Agriculture... Labs etc	Microbiology, Residues etc
Radiological Protection Institute of Ireland (RPII)	Marine products, Meats, Others	Any stage	Various	Radiological Protection Institute of Ireland	Ionising Radiation…
FSAI surveys	Any Foodstuff	Any Stage	FSAI etc	Dependent on Testing Parameter(s) and lab capacity	'New' Parameters of concern Any Other Parameter..

* Some official testing of food is also performed by the Veterinary Laboratory Service, including the Central Veterinary Research Laboratory, and by the Interim Salmonella Reference Laboratory, UCHG, Galway, also see Directory of Food Safety Laboratory Services, *Safe*food, for more details on food testing labs in Ireland.

Note 1: the Public Analysts' Laboratory Service operate a system of Core Testing and Specialisations. **Core Testing:** Microscopy/Complaints; General Labelling; Pb/Cd; ELISA; Fat; Protein; Moisture etc. Some **Specialisations include: Dublin PAL:** Food Contact Materials (Overall Migration, BADGE; Furan, Aromatic amines, ESBO, ITX etc); Acrylamide and Melamine; Mycotoxins Import; Allergens (Peanut, Egg & Celery Protein etc); PAHS (x 16); Others. **Cork PAL:** Pesticides (Infant Formula..); GMO Testing; Vitamins (A,B,C.D,E..); Congeners (spirits etc); Oil Profiles (Saturated/Unsat'd etc); Food Irradiation; Cosmetics (UV filters, phthalates etc); Others. **Galway PAL:** Pharmaceuticals; Folic Acid; Marine Biotoxins; 3-MCPD; Benzene; Benzo-[a] pyrene; Food Irradiation; Cosmetics (p-PDA, DEG etc); Others.

Appendix 4: Annual Results Food Contaminants etc (results for all foods tested).

	Non complying or Excessive Samples/Total Samples tested.										
Parameter	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Aflatoxins	4/151 2.6%	8/151 5.3%	11/179 6.1%	12/254 4.7%	3/133 2.3%	4/250 1.6%	8/231 3.5%	6/233 2.6%	13/220 5.9%	8/220 3.6%	1/149 0.7%
Fumonisins	N/T	0/41 0%	2/21 9.5%	0/121 0%	1/72 1.4%	1/86 1.2%	1/44 2.3%	0/52 0%	0/51 0%	0/24 0%	1/10 10.0%
Ochratoxin A	1/33 3.0%	1/54 1.9%	0/152 0%	1/174 0.6%	3/88 3.4%	0/83 0%	2/109 1.8%	1/109 0.9%	N/T	N/T	N/T
Patulin	0/26 0%	0/14 0%	0/52 0%	0/75 0%	0/27 0%	0/4 0%	N/T	0/52 0%	N/T	N/T	N/T
Lead (Pb)	0/114 0%	3/165 1.8%	1/184 0.5%	0/173 0%	3/249 1.2%	0/170 0%	0/330 0%	1/248 0.4%	1/143 0.7%	2/479 0.4%	2/512 0.4%
Cadmium (Cd)	1/114 0.9%	1/168 0.6%	0/184 0%	0/172 0%	0/249 0%	0/120 0%	0/273 0%	0/205 0%	0/130 0%	2/403 0.5%	0/512 0%
Mercury (Hg)	0/3 0%	0/8 0%	0/16 0%	0/36 0%	2/47 4.3%	0/96 0%	2/140 1.4%	0/176 0%	0/74 0%	0/54 0%	0/20 0%
Arsenic (As)	N/T	N/T	N/T	1/134 0.7%	1/99 1.0%	0/188 0%	0/154 0%	0/42 0%	0/47 0%	0/163 0%	0/238 0%
Benzo-[a]-pyrene	0/35 0%	0/27 0%	0/1 0%	28/99 28.3%	9/152 5.9%	4/282 1.4%	2/84 2.4%	2/75 2.7%	2/98 2.0%	19/102 18.6%	0/115 0%
3-MCPD	N/T	30/39 76.9%	15/60 25%	9/163 5.5%	1/94 1.1%	0/90 0%	0/62 0%	0/35 0%	2/73 2.7%	0/96 0%	0/30 0%
Nitrate	1/71 1.4%	3/57 5.3%	0/58 0%	N/T	N/T	N/T	N/T	0/42 0%	0/39 0%	0/35 0%	0/3 0%
Marine Biotoxins: DSPs	0/23 0%	0/100 0%	0/173 0%	1/211 0.5%	0/133 0%	0/103 0%	0/99 0%	1/52 1.9%	0/21 0%	0/11 0%	0/20 0%
AZAs	N/T	N/T	N/T	0/211 0%	0/143 0%	0/108 0%	0/108 0%	0/47 0%	0/20 0%	0/29 0%	0/20 0%
ASPs	N/T	N/T	N/T	0/211 0%	0/140 0%	0/108 0%	0/65 0%	0/41 0%	0/23 0%	0/39 0%	0/36 0%
Gluten in Gluten Free (GF) foods	4/23 17.4%	9/40 22.5%	2/94 2.1%	13/236 5.5%	8/278 2.9%	22/240 9.2%	11/252 4.4%	15/134 11%	4/144 2.8%	1/175 0.6%	2/102 2.0%
Benzene	36/98 36.7%	8/57 14.0%	7/111 6.3%	1/53 1.9%	5/50 10.0%	N/T	N/T	N/T	3/90 3.3%	0/64 0%	0/29 0%
Anti-bacterial Substances (ABS) EC 4-Plate Test	226/1276 17.7%	4/269 1.5%	0/209 0%	0/48 0%	0/95 0%	0/119 0%	0/69 0%	0/73 0%	0/38 0%	0/37 0%	0/38 0%
AV/DPTGs(Oils)	29/117 24.8%	14/56 25.0%	26/108 24.1%	17/70 24.3%	15/82 18.3%	14/74 18.9%	4/62 6.5%	6/37 16.2%	2/17 11.8%	9/32 28.1%	5/27* (18.5%)
Histamine/ Biogenic Amines	0/79 0%	6/140 4.3%	1/125 0.8%	3/214 1.4%	1/97 1.0%	1/297 0.3%	1/114 0.9%	6/129 4.7%	4/139 2.9%	16/131 12.2%	2/128 1.6%
Sorbates/ Benzoates	18/186 9.7%	4/191 2.1%	15/172 8.7%	0/54 0%	6/105 5.7%	2/63 3.2%	18/163 11.0%	3/46 6.5%	2/36 5.6%	2/59 3.4%	6/72 8.3%
Sulphites	10/180 5.6%	10/219 4.6%	9/195 4.6%	8/179 4.5%	1/195 0.5%	1/120 0.8%	6/444 1.4%	7/135 5.2%	6/198 3.0%	1/166 0.6%	8/190 4.2%
Nitrites/Nitrates	18/125 14.4%	13/145 9.0%	18/172 10.5%	27/170 15.9%	17/209 8.1%	7/172 4.1%	4/282 1.4%	10/158 6.3%	13/85 15.3%	11/94 11.7%	2/64 3.1%
Artificial Sweeteners	14/50 28.0%	10/38 26.3%	8/45 17.8%	N/T	0/35 0%	0/8 0%	1/2 50.0%	4/208 1.9%	0/38 0%	N/T	0/41 0%
Food Irradiation	0/62 0%	0/67 0%	0/35 0%	0/191 0%	0/57 0%	0/115 0%	3/248 1.2%	19/246 7.7%	3/291 1.0%	2/335 0.6%	0/253 0%
Food Complaints	139/199 69.8%	154/233 66.1%	129/206 62.6%	180/239 75.3%	147/226 65.0%	149/241 61.8%	108/183 59.0%	84/136 61.8%	77/122 63.1%	77/129 59.7%	69/126 54.8%

N/T = Not tested. *Results exceed Dutch DPTGs limit of 15% or Acid Value of 4.0 (results not designated as "non-complying").

Appendix 5: Fluoridation of Water Supplies HSE West for 2008

FLUORIDATION OF WATER SUPPLIES : GALWAY

Location	Number of samples	Range (mg/L)	Median (mg/L)
Ballinasloe	12	0.69 – 0.86	0.76
Carna	11	<0.10	<0.10
Clarinbridge/Kilcolgan	12	0.11 – 1.01	0.52
Clifden	12	<0.10 – 0.72	0.61
Dunmore/Glenamaddy	12	0.60 – 0.76	0.65
Galway City	110	0.64 – 0.80	0.68
Kinvara	12	0.29 – 0.73	0.57
Luimnagh Waterworks	46	0.59 – 0.70	0.64
Mid-Galway Regional	12	0.42 – 0.69	0.58
Mountbellew	12	0.74 – 0.80	0.77
Oughterard	12	0.17 – 0.76	0.63
Portumna	12	0.50 – 0.61	0.53
Spiddal	14	0.40 – 0.70	0.54
Tuam R.W.S.	12	0.51 – 0.67	0.63

FLUORIDATION OF WATER SUPPLIES : MAYO

Location	Number of samples	Range (mg/L)	Median (mg/L)
Achill	12	0.64 – 0.90	0.72
Ballina	26	0.51 – 0.93	0.71
Erris	13	0.54 – 0.72	0.63
Kiltimagh	12	0.59 – 0.80	0.72
Lough Mask Regional	12	0.68 – 0.75	0.71
Shrule	12	0.53 – 0.75	0.63
Swinford	12	0.40 – 1.10	0.69
Westport	11	0.59 – 0.77	0.67

FLUORIDATION OF WATER SUPPLIES : ROSCOMMON

Location	Number of samples	Range (mg/L)	Median (mg/L)
Ballinlough	12	0.16 – 0.74	0.62
Boyle/Ardcarne	12	0.11 – 0.42	0.17
Castlerea Regional	14	0.58 – 0.95	0.74
Castlerea Urban	12	0.54 – 0.87	0.73
Cortober	6	0.15 – 0.30	0.21
Mount Talbot/Four Roads	12	0.30 – 0.48	0.38
Grangemore	6	<0.10 – 0.12	<0.10
North East Regional	11	0.15 – 0.86	0.52
North Roscommon Regional	23	0.11 – 0.89	0.63
Roscommon Town (Central)	12	0.33 – 1.04	0.72
South Roscommon Regional	12	0.10 – 0.74	0.33

Appendix 5: Fluoridation of Water Supplies HSE West for 2008

FLUORIDATION OF WATER SUPPLIES : DONEGAL

Location	Number of samples	Range (mg/L)	Median (mg/L)
Ballyshannon	2	<0.10 – 0.73	0.37
Buncrana	15	<0.10 – 0.68	0.56
Bundoran	18	<0.10 – 0.78	0.64
Cardonagh Mixed	13	0.64 – 0.75	0.69
Cranford	11	0.47 – 0.79	0.68
Creeslough/Dunfanaghy	13	0.67 – 0.83	0.71
Donegal/Eske	14	0.30 – 0.78	0.66
Falcarragh/Gortahork	14	0.52 – 0.86	0.69
Frosses/Inver	14	<0.10 – 0.61	0.15
Glenties/Ardara	12	<0.10 – 0.10	<0.10
Inishowen East	12	0.63 – 0.81	0.72
Letterkenny	23	0.38 – 0.76	0.65
Lettermacward	13	0.51 – 0.77	0.69
Lough Mourne	15	0.46 – 0.72	0.61
Milford	12	0.54 – 0.67	0.60
Rosses Regional	18	0.40 – 0.67	0.54

FLUORIDATION OF WATER SUPPLIES : SLIGO/LEITRIM

Location	Number of samples	Range (mg/L)	Median (mg/L)
Kinsellagh	17	<0.10 – 0.73	0.18
Lough Gill	42	0.38 – 0.99	0.62
Lough Easkey	14	<0.10 – 0.76	0.58
Lough Talt	11	0.32 – 0.65	0.45
Manorhamilton	12	<0.10	<0.10
South Leitrim Regional	13	0.42 – 0.75	0.51
Sligo North Regional Supply	12	<0.10 – 0.68	0.29
Sligo South Regional	13	0.12 – 0.71	0.54

FLUORIDATION OF WATER SUPPLIES : NORTH TIPPERARY

Location	Number of samples	Range (mg/L)	Median (mg/L)
Castleconnell	12	0.54 – 0.70	0.62
Clareville	12	0.52 – 0.70	0.63
Limerick	4	0.56 – 0.63	0.61
Murroe	12	0.58 – 0.87	0.64
Nenagh	15	<0.10 – 0.73	0.51
Roscrea	14	0.48 – 0.77	0.63
Thurles	24	0.41 – 0.74	0.55

Appendix 5: Fluoridation of Water Supplies HSE West for 2008

FLUORIDATION OF WATER SUPPLIES : LIMERICK			
Location	**Number of samples**	**Range (mg/L)**	**Median (mg/L)**
Abbington	4	0.57 – 0.61	0.59
Abbeyfeale	12	0.30 – 0.71	0.59
Adare	13	0.48 – 0.82	0.71
Clouncagh	12	0.48 – 0.77	0.65
South West Regional/Mount Plummer	12	0.55 – 0.71	0.62
South West Regional/Gurrane	12	0.42 – 0.85	0.60
Kilmallock	12	0.60 – 0.74	0.67
Limerick City	12	0.56 – 0.70	0.64
Newcastle West	12	0.58 – 0.72	0.62
Rathkeale	12	0.30 – 0.73	0.58

FLUORIDATION OF WATER SUPPLIES : CLARE			
Location	**Number of samples**	**Range (mg/L)**	**Median (mg/L)**
Castlelake	3	0.61 – 0.64	0.62
Clarecastle	7	0.22 – 0.73	0.55
Ennis	26	0.37 – 0.78	0.64
Ennistymon	13	0.44 – 0.70	0.62
Kildysart	5	0.56 – 0.82	0.63
Gortglass Lake	8	0.23 – 0.63	0.51
Lisdoonvarna	13	0.57 – 0.75	0.67
Milltown Malbay	13	0.51 – 0.75	0.60
Shannon	9	0.38 – 0.64	0.57
West Clare New Doolough	25	0.65 – 0.92	0.72
West Clare Old Doolough	12	0.60 – 0.78	0.67
Limerick	12	0.51 – 0.75	0.63

Appendix 6.

Concentration of Smoke & Sulphur Dioxide in the atmosphere during 2008 at the Bodkin Roundabout site.

	Microgrammes Per Cubic Metre					
	Smoke			Sulphur Dioxide		
	Average Reading	Lowest Reading	Highest Reading	Average Reading	Lowest Reading	Highest Reading
Jan.	3	1	15	25	17	36
Feb.	7	1	27	16	9	24
Mar.	3	1	12	23	16	31
Apr.	3	1	15	28	16	41
May	4	1	15	54	6	82
Jun.	2	1	9	60	24	83
Jul.	3	1	13	61	38	82
Aug.	2	1	6	61	7	86
Sept.	1	1	2	10	10	10
Oct.	2	1	6	3	1	5
Nov.	5	1	19	32	2	60
Dec.	12	1	57	30	8	90
Average	3.9	1.0	16.3	33.6	12.8	52.5

Appendix 6.

Concentration of Smoke & Sulphur Dioxide in the atmosphere during 2008 at Galway Waterworks.

	Microgrammes Per Cubic Metre					
	Smoke			Sulphur Dioxide		
	Average Reading	Lowest Reading	Highest Reading	Average Reading	Lowest Reading	Highest Reading
Jan.	2	1	10	19	11	27
Feb.	4	1	11	16	10	25
Mar.	2	1	5	15	8	23
Apr.	2	1	7	13	4	22
May	1	1	3	17	4	32
Jun.	1	1	4	18	7	37
Jul.	1	1	4	23	13	36
Aug.	1	1	2	19	10	39
Sept.	3	1	10	16	8	25
Oct.	2	1	13	12	3	35
Nov.	2	1	20	54	31	92
Dec.	2	1	8	44	22	64
Average	1.9	1.0	8.1	22.2	10.9	38.1

Appendix 6. R + P PARTISOL PLUS MODEL 2025 SEQUENTIAL AIR SAMPLER for 2008

STATION: Bodkin Roundabout YEAR 2008 **Galway City Council**

Day	Jan	Feb	March	April	May	June	July	Aug	Sept.	Oct.	Nov.	Dec.
01	-	-	18	30	7	12	18	7	-	-	24	27
02	-	-	15	29	9	10	15	8	-	-	20	9
03	23	-	6	20	15	13	13	8	-	-	43	18
04	20	-	15	12	14	11	12	8	-	-	44	11
05	16	-	18	12	12	12	10	-	-	-	55	11
06	16	-	17	11	20	13	10	-	-	-	25	39
07	15	-	13	10	26	10	12	-	-	-	10	23
08	15	-	19	76	28	7	10	-	-	-	12	14
09	11	-	9	-	8	12	8	-	-	-	10	14
10	15	-	10	9	11	11	10	-	-	-	16	18
11	20	39	20	6	10	7	8	-	-	-	13	16
12	9	34	16	6	29	8	6	-	-	-	22	12
13	9	41	16	9	27	12	6	-	-	-	8	10
14	14	60	23	13	20	11	8	-	-	-	-	25
15	13	46	12	21	21	6	10	-	-	-	-	13
16	12	36	11	19	33	7	17	-	-	-	-	13
17	23	71	15	31	19	12	12	-	-	-	-	24
18	25	86	20	25	13	12	5	-	-	-	-	25
19	-	21	14	22	16	-	35	-	-	-	-	26
20	-	29	12	26	19	13	43	-	-	-	-	25
21	-	23	16	35	21	9	-	-	-	-	9	10
22	-	30	12	27	10	9	9	-	-	-	9	14
23	-	14	9	18	19	10	18	-	-	-	11	34
24	-	13	8	18	22	10	42	-	-	-	17	28
25	-	17	8	16	16	18	51	-	-	-	14	24
26	-	18	9	14	19	10	19	-	-	-	8	25
27	-	16	16	11	19	11	41	-	-	-	14	26
28	-	10	10	9	14	22	25	-	-	-	15	24
29	-	16	14	15	13	15	16	-	-	12	12	28
30	-		-	10	18	15	16	-	-	17	15	39
31	-		-		13		11	-	-	19		35
Monthly Mean	16	33	14	19	17	11	17	8	-	16	19	21
No. of Days exceeding 50µg/m³	0	3	0	1	0	0	1	0	-	0	1	0

No. of Days exceeding 50µg/m³ YEAR 2008 = 6 ANNUAL MEAN = 15.9

APPENDIX 7

Staff 2008

Public Analyst

Mr. Rory Mannion

Deputy Public Analysts

Dr. Anne Bruzzi
Dr. Padraig Burke

Quality Manager

Dr. Helena McGrath (from June 2008)

Acting Quality Manager

Ms. Sharon Crowe (up to June 2008)

Executive Analytical Chemists

Ms. Sharon Crowe
Dr. Michelle Cuffe
Dr. Caroline Lardner
Dr. Brenda Lennon
Dr. Christopher Laffey
Dr. Andrew Flanagan
Dr. Leonie Wallace
Dr. Declan Costello
Ms. Colette Mulhern (Retired Jan 2008)
Dr. Katie Coyle
Dr. Gayle Kealy

Chief Technician

Vacant (Since August 2007 due to embargo)

Senior Laboratory Technicians

Mr. John Creaven
Mr. Martin Patten
Ms. Mary Finan
Ms. Patricia Thornton
Ms. Eithne Clasby
Ms. Elaine Goldrick
Ms. Suzanne Davoren

APPENDIX 7

Staff 2008

Laboratory Technicians

Ms. Cecily Gilmore
Mr. Martin Gilligan
Ms. Noelle Brennan
Mr. Tom Fogarty
Mr. Eric Costello
Ms. Caitriona Greaney
Ms. Sylvia O'Flynn
Ms. Nora Madden
Ms. Amanda McCarron
Ms. Deirdre Muldoon
Ms. Aileen Maughan
Mr. Tommy Heneghan
Ms. Mary Rabbitte (Career break from 01/04/08 to 31/03/09)
Ms. Caroline Lupton (Job sharing)
Ms. Louise Mannion
Ms. Hilary Hardy

Asst. Staff Officer

Ms. Mary Mulvaney

Clerical Officers

Ms. Eileen Mannion
Ms. Attracta Lohan
Ms. Aine Mahoney
Vacant position (Since October 2007 due to embargo)

Housekeeper

Ms. Theola Busch

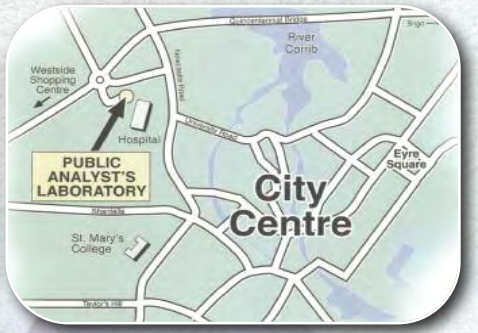
MS. COLETTE MULHERN

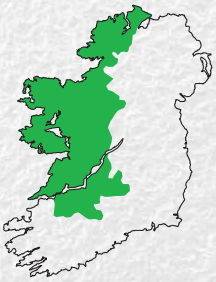
Executive Analytical Chemist

Colette Mulhern retired as Executive Analytical Chemist from this laboratory on the 1st February 2008. Colette joined the laboratory as a temporary part-time Chemist in August 1979 and remained in that capacity until she was appointed permanently in November 2007.

Colette initially worked on the analysis of Environmental samples from mining areas. She then spent some time in the Food Laboratory before moving to the Water Laboratory where she spent most of her working life. She was mainly involved in Fluoride analysis. During her career, she saw many changes in work practices. When she commenced work in the Water Laboratory, fluoride analysis was carried out by the old distillation method where samples had to be refluxed in concentrated Sulphuric Acid – not the most pleasant activity! This method was subsequently replaced by the Ion-specific electrode method which was then superseded by an Ion-Chromatography method. Colette always adapted very well to the challenges of new technology.

We miss Colette's cheerful disposition and her entertaining stories. She maintained many interests outside of work – she played tennis, golf and is a Master bridge player. Now in her retirement, she will have more time for all these activities. We all wish her a very long, happy and healthy retirement in the company of her friends, children and grandchildren.





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