

SURVEY OF COLOURS IN SWEETS

Summary

- Five out of 196 retail samples of packaged sweets contained levels of either sunset yellow FCF or carmoisine in excess of the maximum permitted limit of 50 mg/kg (milligrams per kilogram) in confectionery. A maximum permitted limit of 300 mg/kg, for some other colours singly or colours in combination, was not exceeded in any of the samples.
- Fourteen of the samples of sweets contained colours that were not listed on the label. The Food Standards Agency considers that consumers should be fully informed about the presence of ingredients in food, and is pressing for all ingredients, including all additives, to be indicated on food labels. This is part of the Agency's Food Labelling Action Plan.
- The Food Standards Agency is working with local authorities to ensure that the law on colours in sweets is fully observed. Although industry has apparently taken action in the majority of cases where the survey found problems, there is some uncertainty remaining. Local enforcement authorities have been informed and are taking action as part of their own programmes to test sweets for colours.

Background

There has been some evidence that levels of artificial colours in sweets may on occasion be above the permitted limits.¹ The survey reported here was conducted to determine the extent, if any, to which levels of colours in packaged sweets exceed the maximum permitted limits.²

The use of colours in foodstuffs is controlled by *The Colours in Food Regulations 1995*, as amended.² In these regulations and hence in reporting this survey 'colour' means a food additive that is used or intended to be used for the primary purpose of adding or restoring colouring in a food. The following colours were included in this survey: E102 (tartrazine),

E104 (quinoline yellow), E110 (sunset yellow FCF), E122 (azorubine, carmoisine), E124 (ponceau 4R, cochineal Red A), E127 (erythrosine), E128 (red 2G), E129 (allura red), E131 (patent blue V), E132 (indigo carmine), E133 (brilliant blue), E142 (green S) and E151 (brilliant black). These may be used singly or in combination in confectionery up to a maximum limit of 300 mg/kg. The quantities of each of three of the above colours, E110, E122 and E124, may not exceed 50 mg/kg.

Methodology

Samples and timing

Two hundred samples were purchased in triplicate by Ventress Technical Services (VTS) Ltd., between November 2000 and May 2001. Their analysis was completed by the end of November 2001. The results were collated, checked and reviewed in December 2001 and January 2002, and in some cases put to suppliers and manufacturers to answer questions about the findings in February and March 2002.

The majority of samples were obtained from four localities in England: London (44 samples), Sevenoaks and district (43 samples), Blackpool and district (41 samples), and Peterborough and district (36 samples). Samples with packaging that was damaged after purchase or were otherwise unsuitable for analysis were replaced by 36 samples purchased in the Cambridge area. The variety of different samples from these locations was sufficiently great to provide a reasonably representative set of samples for the country as a whole.

Samples were selected that were distinctly coloured, from the following categories:

- Jellies/jelly foam sweets: 65 samples
- Boiled sweets: 31 samples
- Hard gums: 27 samples
- Mallows: 17 samples
- Liquorice (not black): 2 samples
- Miscellaneous: 58 samples

Samples were purchased from different types of shops: 47 per cent from supermarkets/grocers; 9 per cent from department stores; 14 per cent from newsagents;

9 per cent from corner stores; 8 per cent from petrol stations; and 13 per cent from kiosks, cinemas and cafes.

Confectionery which was not brightly coloured was excluded from the survey (e.g. white sweets). To allow sufficient time for analysis, products with less than six weeks to their expiry date from date of purchase were not obtained.

All samples (Table 1) were uniquely coded by region at the time of purchase:

- Sevenoaks and district: samples with codes between AA02578 & AA02702 (except sample AA02683 from the Cambridge area).
- Blackpool and district: samples with codes between AA02703 & AA02752.
- Peterborough and district: samples with codes between AA02754 & AA02804 (except sample AA02766 from Cambridge area and samples AA02781 & AA02783 from London).
- London: samples with codes between AA02805 & AA03034.
- Cambridge area: samples with codes between AA03135 & AA03993.

All samples were analysed by Reading Scientific Services Ltd. (RSSL). Duplicate samples were retained by VTS Ltd. should others wish to undertake their own analysis of the samples.

Standard Solutions

Standards were prepared from colours supplied by Warner Jenkinson Europe. Individual stock solutions were prepared at 1 mg/ml. Mixed working standards were prepared in three groups: (i) quinoline yellow, sunset yellow, carmoisine; (ii) tartrazine, allura red, ponceau 4R, erythrosine, brilliant blue, brilliant black; and (iii) red 2G, green S, indigo carmine, patent blue. 1 or 2 ml of each relevant stock solution was made up to 50 ml volume with 0.02M ammonium acetate solution to give a working standard of approximately 0.02 mg/ml.

Standard Colour Contents

Colour contents were calculated by further diluting each stock solution 1:10 in 0.044M ammonium acetate solution, and measuring the absorbance at λ_{\max} in a 1 cm cell,

and converting to colour content using factors based on Commission Directive 95/45/EC, which lays down specific purity criteria concerning colours for use in foodstuffs. The stock standard solutions were stored in a darkened cupboard and their colour contents were re-measured monthly. Indigo carmine stock solution, whose solutions are unstable even in the dark, was freshly prepared on each occasion of use.

Quality Control (QC) Sample

The QC sample was taken from a single production batch of wine gums manufactured by Trebor Basset Ltd., Sheffield, containing quinoline yellow as a colour. It was reduced to a powder in the same way as the analytical samples (see below) and a fresh extract of this powder was carried through with each analytical batch.

Analytical Methodology

The contents of each sample bag were cut into small pieces, homogenised and crushed to a fine powder. In most cases (for example gums and jellies) samples were frozen in liquid nitrogen, then rapidly ground using a steel goblet blender. Samples such as boiled sweets were ground directly in a laboratory Retsch mill. The powdered materials were transferred to labelled Sterilin pots and sealed internally with parafilm to inhibit moisture pickup or desiccation. The pots were then stored under ambient conditions (boiled sweets) or deep-frozen (gums and jellies) until analysis.

An accurately weighed aliquot (5 g) of crushed sample was dispersed in hot water (10 ml), transferred quantitatively to a 50 ml volumetric flask and made up to volume with a solution of 4 per cent ammonia (0.880) in methanol. The sample was centrifuged and an aliquot of the supernatant was taken to dryness in a rotary evaporator. The dry residue was re-dissolved in 0.02M ammonium acetate solution and filtered prior to High Performance Liquid Chromatography (HPLC) injection.

HPLC Analysis

The HPLC system was a Hewlett-Packard HP1090 diode array system operated under the following conditions:

Column: Phenomenex Columbus C18 4.6 × 150mm
 Temperature: 45 °C
 Flow rate: 1.0 ml per minute
 Injection Volume: 0.025 ml
 Detection wavelength: 415 nm, bandwidth 4 nm - Yellows
 490 nm, bandwidth 4 nm - Oranges
 520 nm, bandwidth 4 nm - Reds
 598 nm, bandwidth 4 nm - Greens and Blues
 Reference wavelength: None
 Mobile phase A: 0.02M ammonium acetate solution
 Mobile phase B: Acetonitrile

Gradient programme:

<i>Time (mins)</i>	<i>% Mobile phase A</i>	<i>% Mobile phase B</i>
00	95	5
20	50	50
24	0	100
28	0	100
30	95	5
40	95	5

The sample extracts were analysed in 19 analytical batches of 10 to 15 samples each, using HPLC with diode array detection. The colours of interest were identified by retention time and their identity was confirmed by diode-array spectral matching. The concentration of each colour in the samples was calculated as a proportion of peak area produced by the corresponding external standard (corrected for colour purity content). For quinoline yellow and indigo carmine, where two major colours are present in each case, the areas of both main peaks were summed. When calculating the colour concentration in the sample solids, the same two peaks only were used in the calculation.

Quality Assurance

Standard calibration samples were included with each analytical batch. Typically, every tenth analytical sample in a batch was extracted and analysed in duplicate. The quality

control (QC) sample was extracted and run at least once with each analytical batch (usually in duplicate by different analysts) to check repeatability and reproducibility. The overall coefficient of variation (CV) during the study (reproducibility) was 4.1 per cent, while the CV for one analyst analysing the same sample ten times in the same session (repeatability) was 2.6 per cent. The limit of quantification (LOQ) for each colour was 2 mg/kg, and the limit of detection (LOD) was 0.5 mg/kg.

Results were not corrected for recovery since 'spiking' colours into solid sweets as a blank was not practical. However recoveries were very close to 100 per cent:

- No colour remained in the sample pellet after centrifugation (i.e. all the colour passed into the methanolic ammonia phase).
- Recoveries close to 100 per cent were established previously using very similar methodology where 'spiking' into the liquid phase was practicable.³

To ensure that results obtained by the laboratory carrying out the survey (RSSL) were of acceptable accuracy, a random sub-set of ten ground samples was sent to an independent laboratory (Eurofins Scientific) for 'blind' analysis (Table 2). Statistical analysis (paired t-test) showed that the results did not differ significantly from those obtained by RSSL ($p = 0.05$) except in the case of quinoline yellow, where Eurofins Scientific obtained slightly lower results. This discrepancy was due to the two analysts using different quinoline yellow standards, the Eurofins standard (Flaverco Red Rose Ltd.) containing more later eluting peaks than the RSSL standard (Warner Jenkinson Europe).

Samples with levels of colour in excess of legislative limits were re-extracted and re-analysed for confirmation of the data. There were no major differences in results between initial and confirmatory analysis (Table 3).

Four samples could not be analysed by the current methodology and are indicated NA in Table 4. Three of these (samples AA02820, AA02823 and AA03140) gave a yellow oil on top of the liquid when the sample was dispersed into water and methanolic ammonia. The ingredients listing for each of these samples gave vegetable fat or oil as the third ingredient and it was evidently present in sufficient quantities to form a second floating phase. The fourth sample (AA03243) formed clumps on the addition of water and methanolic ammonia, and could not be dispersed to distribute the colour into the liquid phase.

Reporting

Brand names were reported as this survey was carried out in accordance with guidelines for reporting survey results published in the *Food Safety Information Bulletin* in September 1997. The absence of a particular brand from Tables 1 and 4 means only that the brand was not included in the survey.

Results, interpretation and action

The methodology used in this work proved to be robust, as reported above, and samples were representative of the general supply. Sample representativeness was tested by checking whether there was a geographical pattern in the amounts of colours found. Apart from speciality products intended for local consumption no such geographical pattern would be expected. Indeed it was not detected by statistical analysis of the survey data, using chi square calculations for multinomial probabilities.

Levels of colours in all tested samples were within the statutory limit of 300 mg/kg for total colour (Table 4). No samples contained red 2G or erythrosine. But in five samples the levels of sunset yellow or carmoisine were clearly above the respective legal limit of 50 mg/kg (Table 3). The levels in these samples were clearly above this limit even after taking into account variation in performance of the extraction and analytical methods used. Consumer health should be adequately protected provided that the limits in *The Colours in Food Regulations 1995*, as amended, are observed.² If the law is observed intakes of sunset yellow FCF and carmoisine should be within the respective Acceptable Daily Intakes (ADIs) set by the Scientific Committee on Food.⁴ This is true for both children and adults. Intakes calculated for samples containing the highest levels of sunset yellow or carmoisine were still within the respective ADIs for adults and children. These calculations were for mean levels of colours and 97.5 percentile consumption. This is the approach adopted in the European Union for comparing intakes of additives and ADIs.⁴ If the limits in law are not observed this will push intakes close to or possibly above the respective ADIs for sunset yellow FCF and carmoisine.

Colours not listed on the label were found in 14 samples of sweets (Table 5). Prepacked sweets, like other prepacked foods, are required to list their ingredients in accordance with regulations 12 to 18 of *The Food Labelling Regulations 1996* (as amended).⁵ Additives

added to or used in a food to serve the function of a colour must be identified by that category name ('colour') followed either by the specific name of the additive or its serial number (regulation 14(9) and Schedule 4). If an ingredient of a food is a compound ingredient (i.e. it contains other ingredients, including additives), its ingredients do not have to be listed if that compound ingredient constitutes less than 25% of the finished product. But additives which are ingredients of compound ingredients have to be listed if they perform a technological function in the final food. If they do not perform a technological function in the final food, they do not have to be listed (regulations 15(4)(b) and 17). It is generally an offence to sell any food which is not marked or labelled in accordance with these and other provisions set out in Part II of *The Food Labelling Regulations 1996* (as amended) (regulation 44(1)(a)). The Food Standards Agency considers that consumers should be fully informed about the presence of ingredients in food, and is pressing for all ingredients, including all additives, to be indicated on food labels. This is part of the Agency's Food Labelling Action Plan.

The results for the five samples containing levels of colours above the respective legal limit and for those samples containing colours not listed on the label, were sent to the respective companies for their comments (Annex 1). These comments showed that although industry has apparently taken action in the majority of cases where the survey found problems, there is some uncertainty remaining. One of the suppliers of a sample with an illegally high level of carmoisine did not provide comments on this result. Some of the companies whose samples containing colours not listed on the label also failed to reply to the Agency's letter about the survey. Local enforcement authorities have been informed and are taking action as part of their own programmes to test sweets for colours.

References

1. Perils that lurk in sweets. *Environmental Health News* 26 February 1999.
2. *The Colours in Food Regulations 1995* (S.I. No. 1995/3124, as amended by S.I. 2000/481 and S.I. No. 2001/3442).
3. Survey of colours in sauces. *Food Surveillance Information Sheet* no. 3, 2000.
4. Council of the European Union, Report from the Commission on dietary food additive intake in the European Union, document DENLEG 47, 2001.
5. *The Food Labelling Regulations 1996* (S.I. No. 1996/1499, as amended by S.I. No. 1998/1398, S.I. No. 1999/747 and S.I. No. 1999/1486).

Further information

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This is the final report of this survey. Copies of it have been placed on the Agency's website and in the library in Aviation House, 125 Kingsway, London WC2B 6NH.

Table 1: Details of samples obtained

Sample code	Samples	Brand	Product type/ category	Pack size	Country of origin	Batch code	Best before /use by date	Date purchased/ sampled	Place of purchase
AA02578	Pico-Balla liquorice allsorts	Haribo	Liquorice	200g	Not stated	L01	07:01	06.12.00	Woolworths
AA02585	American hard gums	Woolworths	Hard gum	300g	Not stated	4L0257B	Jun 01	06.12.00	Woolworths
AA02586	Apple squiggly worms	Woolworths	Miscellaneous	120g	Not stated	L0208	Feb 2002	06.12.00	Woolworths
AA02587	Tropifruit fruit flavoured gums	Haribo	Jelly	225g	Not stated	L-440236-A	Nov 01	06.12.00	Woolworths
AA02597	Trolli Dracula	Mederer	Jelly	150g	Not stated	N09	070302	06.12.00	Dry Goods Market Stall
AA02606	Teddy bears	Devonia	Hard gum	200g	Not stated	LM0306-A	02 Aug 2001	06.12.00	Dry Goods Market Stall
AA02620	Fruity soft centres	Asda	Miscellaneous	200g	Not stated	L0 296 DA	Jul 2001	15.01.01	Asda
AA02621	Wine gums	Asda	Hard gum	250g	Not stated	LK0346	Aug 2001	15.01.01	Asda
AA02632	Lemon bon bons	Bassett's	Miscellaneous	200g	Not stated	0294/1	07/2001	16.01.01	Shell
AA02635	Football mix	Haribo	Miscellaneous	200g	Not stated	L030186-A	09/01	15.01.01	Asda
AA02636	Original midget gems	Lion	Hard gum	227g	Not stated	L0334	Nov 2001	15.01.01	Asda
AA02637	Midget gems	House of York	Hard gum	170g	Not stated	LB0317DM	13 05 2002	15.01.01	Asda
AA02638	Fluffy stuff cotton candy	Charms	Miscellaneous	60g	USA	20 10 01	20 10 01	15.01.01	Sainsbury's
AA02642	Fruit drops	Seldon	Boiled	160g	Not stated	16 10 01	16 10 01	15.01.01	Polehill Farm Shop
AA02643	Astra Kid starch gums	Astra	Jelly	200g	Not stated	LT0260A	16/03/2002	15.01.01	Polehill Farm Shop
AA02644	A. B. C.	Astra	Hard gum	200g	Not stated	LT0263A	19/03/2002	15.01.01	Polehill Farm Shop
AA02647	Fruit drops – fruit flavoured boiled sweets	Co-Op	Boiled	250g	Not stated	0299	Jun 2001	15.01.01	Co-Op
AA02649	Mini jelly babies – fruit flavoured gums	Co-Op	Jelly	215g	Not stated	LG0313	Jul 2001	15.01.01	Co-Op
AA02650	Fruit pastilles	Rowntree's	Jelly	216g	UK	L044B01	01Jul01	16.01.01	Shell
AA02677	Jelly babies	Naturally Sweet Co.	Jelly	100g	Not stated	Oct 01	Oct 01	16.01.01	Westerham Serv. Stn
AA02678	Jelly babies	Half Pounders	Jelly	227g	Not stated	LM0310-A	Nov 2001	16.01.01	Westerham Serv. Stn
AA02679	Jelly beans	Bonds of London	Miscellaneous	100g	UK	L043000A	Jul 2001	16.01.01	The Old Post Office
AA02680	Joosters jelly beans	Starburst	Miscellaneous	155g	Not stated	CZ3A5	09/02/02	16.01.01	The Old Post Office
AA02681	Dolly mixtures	Victoria	Miscellaneous	150g	Not stated	B272	Sep 01	16.01.01	Westerham Serv. Stn
AA02682	Original gourmet jelly bean - fruit bowl flavours	Jelly Belly	Miscellaneous	100g	Not stated	0213FV2U	31 01 02	16.01.01	The Chocolate Shop
AA02683	Wine gums	Spar	Hard gum	200g	Not declared	LR0347-A	30 Sep 2001	24.01.01	Spar
AA02684	Foam shrimps fruit flavour candy	Somerfield	Mallow	100g	UK	0275	Oct 2001	15.01.01	Somerfield
AA02685	Clear fruits	Somerfield	Boiled	250g	Not stated	0313	Nov 01	15.01.01	Somerfield
AA02687	Jelly beans	The Candyman	Miscellaneous	180g	Not stated	0165	Jun 2001	16.01.01	Domecrest Ltd.
AA02688	Bananas	The Candyman	Mallow	170g	Not stated	0292	Oct 2001	16.01.01	Domecrest Ltd.
AA02689	Fried eggs	The Candyman	Mallow	140g	Not stated	0182	Jul 2001	16.01.01	Domecrest Ltd.
AA02690	Chewies – juicy apple	Needlers	Miscellaneous	100g	Not stated	L0095B	Apr 2001	16.01.01	Domecrest Ltd.
AA02691	Cola cubes	Bonds of London	Boiled	227g	Not stated	L022140	Apr 2001	16.01.01	Domecrest Ltd.
AA02692	Bon bons – assorted apple, lemon & strawberry flavour chewy sweets	Co-Op	Miscellaneous	200g	Not stated	L0265C	Sep 2001	15.01.01	Co-Op
AA02693	Fruit pastilles	Somerfield	Jelly	250g	UK	LL0248	May 2001	15.01.01	Somerfield
AA02694	Smilers tropical pastilles	Starburst	Jelly	220g	Not stated	C22B1	17/11/01	15.01.01	Budgens
AA02695	Glacier fruits	Fox's	Boiled	113g	UK	L045C(2)	01 11 01	15.01.01	Budgens
AA02696	Tweenies fruit flavour shaped jellies	Kinnerton	Jelly	100g	EEC	1302	02/1	15.01.01	Budgens
AA02697	Foamy fruits assorted fruit flavour sweets	Co-Op	Mallow	125g	Not stated	0335	Dec 2001	15.01.01	Co-Op
AA02698	Jelly bears – fruit flavoured gums	Co-Op	Jelly	125g	Not stated	L0327	Nov 2001	15.01.01	Co-Op

Table 1: Details of samples obtained (cont'd)

Sample code	Samples	Brand	Product type/ category	Pack size	Country of origin	Batch code	Best before/ use by date	Date purchased/ sampled	Place of purchase
AA02699	Mallow mix fluffy marshmallow pieces	Somerfield	Mallow	150g	Holland	LH0296ED	Oct 01	15.01.01	Somerfield
AA02700	Original sports mixture fruit flavour gums	Lion	Hard gum	215g	Not stated	L0235	Aug 2001	15.01.01	Martin
AA02701	Wise Buys fruit gums	Wilkinsons	Hard gum	300g	Not stated	LM0196	04 2001	15.01.01	Martin
AA02702	Gummy zingy fruits	Bassett's	Jelly	190g	Not stated	L650172-P	03/01	15.01.01	Budgens
AA02703	Polo smoothies	Nestlé	Boiled	156g	Not stated	L033F	01/08/01	14.01.01	Iceland
AA02704	Tangtastic	Haribo	Jelly/ foam	175g	Not stated	L020234 - A	10/01	14.01.01	Smokers Choice
AA02705	Fruit assortments	Tesco	Boiled	200g	UK	L032706	Aug 2001	14.01.01	Tesco
AA02706	Banana & strawberry laces	Safeway	Miscellaneous	50g	Holland	L0285	Sept 01	14.01.01	Safeway
AA02707	Strawberry laces	Safeway	Miscellaneous	100g	Holland	L0305	Oct 01	14.01.01	Safeway
AA02708	Fizzy blue raspberry flavour laces	Safeway	Miscellaneous	100g	Holland	L0273	July 01	14.01.01	Safeway
AA02709	Dolly mixtures	Safeway	Miscellaneous	150g	UK	LM0324	Aug 2001	14.01.01	Safeway
AA02711	Tangtastic	Haribo	Jelly/ foam	225g	Not stated	L020301-A	12/01	14.01.01	Wilkinsons
AA02712	Fruit assortments	Dobsons	Boiled	350g	Not stated	L021840A	Mar 2001	14.01.01	Iceland
AA02713	Fruit pastilles	Rowntree's	Jelly	52.5g	UK	L046A3	01/Jul/01	14.01.01	Morrisons
AA02715	Yorkshire mixture	Dobsons	Boiled	227g	Not stated	W38	Nov 01	14.01.01	Morrisons
AA02716	Teeth and lips	Tesco	Jelly/ foam	60g	Germany	L03262	Oct 2001	14.01.01	Tesco
AA02717	Straws (cola)	Malaco	Hard gum	100g	Denmark	C701561	01/05/01	14.01.01	Morrisons
AA02718	Fruit bon bons	Bassett's Fundays	Boiled	188g	Not stated	LC0299-A	10/2001	14.01.01	Elf Service Station
AA02719	Jelly babies	Bassett's	Jelly	225g	Not stated	LC0307	07/2001	14.01.01	Elf Service Station
AA02721	Campino oranges and cream	Storck	Boiled	140g	Germany	A32E	March 01	14.01.01	Elf Service Station
AA02722	Fun fruits	Tesco	Jelly/ foam	60g	Germany	L03391	Nov. 2001	14.01.01	Tesco
AA02723	Campino strawberries and cream	Storck	Boiled	140g	Germany	C37K	05/01	14.01.01	Elf Service Station
AA02724	Joosters	Starburst	Miscellaneous	230g	Not stated	CZ6B5	04/05/02	14.01.01	Woolworths
AA02725	Mallowmix	Somerfield	Mallow	150g	Holland	LH0296	Oct 01	14.01.01	Kwik Save
AA02726	Jelly babies	Bassett's	Jelly	225g	Not stated	LL031121/44	07/2001	14.01.01	Woolworths
AA02727	Glucose fruits	Oatfield	Boiled	96g	Ireland	L0347	Dec 2002	14.01.01	Half Price or Less
AA02728	Smilers	Starburst	Jelly	50g	Not stated	CZ7AZ	31:03:01	14.01.01	Half Price or Less
AA02729	Jelly babies	Woolworths	Jelly	225g	Not stated	7L0332E	Aug 01	14.01.01	Woolworths
AA02731	Wine gums	Woolworths	Hard gum	200g	Not stated	LK02980040	Jul 2001	14.01.01	Woolworths
AA02732	Marshmallows	Princess	Mallow	128g	Not stated	0310	Aug 2001	14.01.01	Kwik Save
AA02733	Wine gums	Lion	Hard gum	100g	Not stated	L01641	June 2001	14.01.01	Smokers Choice
AA02734	Chicken Run fruit flavoured shaped jellies	Kinnerton	Jelly	125g	EEC	020202	020202	14.01.01	Half Price or Less
AA02735	Midget gems	Lion	Hard gum	125g	Not stated	L0319	Nov. 2001	14.01.01	Smokers Choice
AA02736	Wine gums	Somerfield	Hard gum	250g	Not stated	LK0339	Aug 2001	14.01.01	Kwik Save
AA02737	Dolly mixtures	Haribo	Miscellaneous	175g	Not stated	L010201-A	09/01	14.01.01	Smokers Choice
AA02738	Dolly mixtures	Somerfield	Miscellaneous	100g	UK	LM0317	Aug 2001	14.01.01	Kwik Save
AA02740	Sweet 'n' Fun family	Disney	Miscellaneous	240g	Not stated	04	11:08:2001	14.01.01	Busy Dee's
AA02741	Sweet 'n' Fun mix	Disney	Jelly/ foam	240g	Not stated	R5	25/07/2001	14.01.01	Busy Dee's
AA02744	Lemon bon bons	Bassett's	Miscellaneous	200g	France	L0326/2	08/2001	14.01.01	Shell
AA02745	Blackcurrant and liquorice	Iceland	Boiled	319g	Not stated	L0321	Aug 2001	14.01.01	Iceland
AA02746	Jelly babies	Haribo	Jelly	175g	Not stated	L-410294-A	Jan 02	14.01.01	Shell
AA02747	Fruit drops	Iceland	Boiled	367g	UK	L0251 02	Sept 2001	14.01.01	Iceland
AA02749	Kiddies supermix	Haribo	Jelly/ foam	175g	Not stated	L030307-A	02/02	14.01.01	Shell
AA02751	Wine gums	Morrisons	Hard gum	227g	Not stated	3L0314E	Aug 2001	14.01.01	Morrisons
AA02752	Fruit pastilles	Morrisons	Jelly	227g	Not stated	2L03347E	Sept 01	14.01.01	Morrisons

Table 1: Details of samples obtained (cont'd)

Sample code	Samples	Brand	Product type/ category	Pack size	Country of origin	Batch code	Best before/ use by date	Date purchased/ sampled	Place of purchase
AA02754	Flumps	Bassett's & Beyond	Mallow	300g	Not stated	LH0180MD	MARCH 2001	26.11.00	Bewise Ltd.
AA02755	Fruit flavour Tweenie shaped jellies	Kinnerton	Jelly	150g	Not stated	L0249H80	Sep 2001	26.11.00	Bewise Ltd.
AA02756	Christmas Berry fruit (flav) nougat	The Traditional Sweet Company Ltd.	Miscellaneous	150g	Not stated	L0192	NOV 01	26.11.00	Country Fayre Confectionery
AA02757	Chicken Run fruit flavoured shaped jellies	Kinnerton	Jelly	125g	Not stated	16 01 02	16 01 02	26.11.00	Superdrug
AA02762	Skittles	Mars	Miscellaneous	345g – 50% extra free	Not stated	SP0344B	14 07 01	26.11.00	Warehouse Clearance Shop
AA02763	Super Disco's	Astra Sweets	Miscellaneous	60g	Not stated	300803	300803	26.11.00	Fair Rock Stall
AA02766	Rhubarb and custard	Churchill's	Boiled	180g	Not declared	145 BS	May 01	29.01.01	Country Stores
AA02767	Fruit gummies	Gummi Candy	Jelly	350g	Germany	09.05.02	09.05.02	26.11.00	Iceland
AA02768	Fruit assortment	Dobson's	Miscellaneous	350g	Not stated	L021840	MAR 2001	26.11.00	Iceland
AA02769	Soft fruit gums	Iceland	Hard gum	350g	UK	LM0251	May 2001	26.11.00	Iceland
AA02770	Horror mix	Haribo	Jelly/ foam	225g	Not stated	L260248-A	11/01	26.11.00	Iceland
AA02772	Jelly lips fruit flavour gums	Kids Treats	Jelly	100g	Germany	L0119	NOV 2001	26.11.00	Poundstretcher
AA02773	Strawberry laces	Asda	Miscellaneous	100g	Holland	L0279	SEP 2001	26.11.00	Asda
AA02774	Gummy jungle mix	Bassett's & Beyond	Jelly/ foam	190g	Not stated	L620174.P	03/01	26.11.00	Asda
AA02775	Jelly letters assorted fruit flavour gums	Kids Treats	Jelly	100g	Germany	L02221	FEB 2002	26.11.00	Poundstretcher
AA02776	Super sour snakes	Asda	Jelly	100g	UK	L020309-A	AUG 01	26.11.00	Asda
AA02777	Big slice fruit flavoured pops	Anytime	Boiled	170g	Mexico	L0174	06 02	26.11.00	Poundstretcher
AA02778	Apple flavour laces	A-2-Z	Miscellaneous	100g	Holland	L0040	AUG 2001	26.11.00	Poundstretcher
AA02779	Candy pencils	Anytime	Miscellaneous	100g	EEC	L-H-0314-1	April 2002	26.11.00	Asda
AA02780	Justfruit gums	Bassett's Fundays	Hard gum	200g	Not stated	LK0237	08 2001	26.11.00	Shell
AA02781	Fruit pastilles	Rowntree's	Jelly	52.5g	Not declared	L0N05725	01 Jun 01	06.01.01	Bridges Confectionery
AA02783	Gummy icecream – candy foam jellies	Dulciora	Foam jelly	220g	Not declared	23/08/02	23/08/02	06.01.01	New Look
AA02785	Jelly Bean Factory gourmet mix	Jelly Bean Factory	Miscellaneous	125g	Not stated	0304	05 02	26.11.00	Tesco Extra
AA02786	Mini burger	Trolli	Jelly/ foam	100g	Not stated	A025	10 08 01	26.11.00	Poundstretcher
AA02787	American hard gums	Bassett's Fundays	Hard gum	200g	Not stated	L0263	SEP 2001	26.11.00	Shell
AA02788	Wine gums	Maynards	Hard gum	52g	Not stated	L30304	10 2001	26.11.00	Shell
AA02789	Tingling trees	Marks and Spencer	Boiled	100g	Not stated	XOGEL	13/03/01	26.11.00	Marks and Spencer
AA02791	Fruit pastilles	Rowntree's	Jelly	52.5g	UK	L9N05285	01 May 01	26.11.00	W. H. Smith
AA02792	Skittles	Mars	Miscellaneous	55g	Not stated	U7C	15-09-01	26.11.00	W. H. Smith
AA02793	Assorted fruit flavour lollipops	Tesco value	Boiled	140g	UK	0319	Aug 2001	26.11.00	Tesco Extra
AA02795	Fizzy neon worms	Tesco	Jelly	60g	Germany	L0250	Aug 2001	26.11.00	Tesco Extra
AA02796	Jelly tots	Rowntree's	Jelly	168g	Not stated	L039A1	01 MAR 01	26.11.00	Tesco Extra
AA02797	Build-a-burger	Haribo	Jelly/ foam	200g	Not stated	L240195-A	09/01	26.11.00	Superdrug
AA02798	Ice cream cones	Tesco	Mallow	60g	Germany	L0313	Oct 2001	26.11.00	Tesco Extra
AA02799	Real fruit jellies	Thorntons	Jelly	115g	Not stated	FOJHR	31/05/01	26.11.00	Thorntons
AA02800	Pokémon fruit flavoured jellies	Lutti	Jelly	68g	Belgium	01 12 01	01 12 01	26.11.00	Market News
AA02802	Bob the Builder	Marks and Spencer	Jelly	100g	UK	27 03 01	27 03 01	26.11.00	Marks and Spencer
AA02803	Mini jelly babies	Waitrose	Jelly	125g	UK	LR0289-P	16 OCT 2001	26.11.00	Waitrose
AA02804	Kiddie's super mix fruit flavour sweets	Haribo	Jelly/ foam	225g	Not stated	L010298-A	12/01	26.11.00	Waitrose
AA02805	Fruit salad	Buzz	Hard gum	120g	Not declared	0325	Nov 2001	10.12.00	Hulya Supermarket

Table 1: Details of samples obtained (cont'd)

Sample code	Samples	Brand	Product type/ category	Pack size	Country of origin	Batch code	Best before/ use by date	Date purchased/ sampled	Place of purchase
AA02808	Strawberries	Buzz	Mallow	105g	Not declared	0331	Nov 2001	10.12.00	Hulya Supermarket
AA02809	Dolly mixture	Buzz	Miscellaneous	110g	Not declared	0276	Oct 2001	10.12.00	Hulya Supermarket
AA02810	Fruit gums	Rowntree's	Hard gum	140g	Not declared	L033C3	01 AUG 01	10.12.00	Buy Best
AA02811	Fruit bon bons	Bassett's Fundays	Miscellaneous	188g	Not declared	LC0251-A	08-2001	10.12.00	Buy Best
AA02813	Marsh mallows	Bobby's	Mallow	100g	Spain	05-07-01	05-07-01	10.12.00	Happiness
AA02814	Gummy zingy fruits	Bassett's & Beyond	Mallow	190g	Not declared	L650173-A	03/01	10.12.00	Gregory's
AA02815	Millions cola	Millions	Miscellaneous	75g	Not declared	30603	Oct 2002	10.12.00	Gregory's
AA02816	American hard gums	Chelsea Sweet Co.	Hard gum	180g	Not declared	0299	Oct 2001	10.12.00	Ricky's News
AA02817	Jelly babies	Chelsea Sweet Co.	Jelly	180g	Not declared	0296	Oct 2001	10.12.00	Ricky's News
AA02818	Blackcurrants & raspberries	Chelsea Sweet Co.	Hard gum	170g	Not declared	0276	Oct 2001	10.12.00	Ricky's News
AA02819	Peach rings	Chelsea Sweet Co.	Jelly	180g	Not declared	0299	Oct 2001	10.12.00	Ricky's News
AA02820	Fruit sherberts	Pascall	Miscellaneous	142g	Not declared	L022606	11 2001	10.12.00	Happiness
AA02822	Wine gums	Maynards	Hard gum	225g	Not declared	LK0304	10 2001	10.12.00	Shell
AA02823	Original fruits	Starburst	Miscellaneous	300g	Not declared	U2C	15-09-01	10.12.00	Shell
AA02824	Kiddie's super mix fruit flavour sweets	Haribo	Jelly/ foam	175g	Not declared	L230151-A	07/01	10.12.00	Toby's Wine
AA02825	Fantasy mix - fruit flavour & sweet foam gum	Haribo	Jelly/ foam	175g	Not declared	L030236-A	10/01	10.12.00	Toby's Wine
AA02826	Tropifruitti - tropical fruit flavour gums	Haribo	Hard gum	175g	Not declared	L-410061-A	JUN 01	10.12.00	Toby's Wine
AA02827	Fruitta – soft fruit pastilles	Haribo	Jelly	175g	Not declared	L069334-A	01/01	10.12.00	Toby's Wine
AA02828	Pear drops	Bassett's Fundays	Boiled	200g	Not declared	LE0233-N	02-2002	10.12.00	Church Hill Service Station
AA02829	Sweetstars fruit drops	Bonds of London	Boiled	219g	Not declared	L021040	MAR 01	10.12.00	Gregory's
AA02830	Strawberry bon bons	Bassett's Fundays	Miscellaneous	200g	Not declared	L0269/1	06/2001	10.12.00	Gregory's
AA02831	Campino oranges & cream	Storck	Boiled	140g	Germany	B30D	03.01	10.12.00	Gregory's
AA02832	Chewies – soft chews	Needlers	Miscellaneous	100g	Not declared	L0366A	Feb 2001	10.12.00	Buy Best
AA02833	Mega power rolls shocker sour candies	Mega Shocker	Miscellaneous	51g	Spain	L133F03A	12.05.02	10.12.00	Food & Wine
AA02834	Mega sour heads megamix	Bobby's	Miscellaneous	100g	Not declared	L0402C400	07-2001	10.12.00	Food & Wine
AA02835	Marshmallows	Ginni's	Mallow	100g	Not declared	L2244	Aug 01	10.12.00	Buy Best
AA02837	Strawberry bricks	Ginni's	Miscellaneous	150g	Not declared	L2235	Mar 02	10.12.00	Buy Best
AA02838	Marshmallows	Ginni's	Mallow	100g	Not declared	L2181	July 01	10.12.00	Buy Best
AA02839	Midget gems – fruit flavour gums	Bobby's	Hard gum	115g	Not declared	LK0226	Jun 2001	10.12.00	Food & Wine
AA02840	Taz gummy	Dulciora	Jelly/ foam	60g	Not declared	L722003	01/02	06.01.01	New Look
AA02841	Millions strawberry	Millions	Miscellaneous	75g	Not declared	31103	NOV 2002	06.01.01	New Look
AA02842	Daffy gummy - fruit flavoured jelly foam shapes	Dulciora	Jelly/ foam	50g	Not declared	L714929	07-01	06.01.01	New Look
AA02844	Fried eggs	Pierrot Gourmand	Jelly/ foam	120g	France	257N	09.2002	06.01.01	New Look
AA02845	Fried eggs – candy foam jellies	Dulciora	Jelly/ foam	220g	Not declared	22/08/02	22/08/02	06.01.01	New Look
AA02846	Alligators	Pierrot Gourmand	Jelly/ foam	152g	France	259N	09.2002	06.01.01	New Look
AA02848	Nougat	Old London Confectionery	Miscellaneous	60g	Not declared	JUN 01	JUN 01	06.01.01	Sweetworld
AA02851	Fruit drops	Pascall	Boiled	142g	Not declared	L021206	07.2001	06.01.01	Blackhorse Road Underground Station Newsagent
AA02852	Fruit pastilles	Pascall	Jelly	165g	Not declared	LA0227	05.2001	06.01.01	Blackhorse Road Underground Station Newsagent

Table 1: Details of samples obtained (cont'd)

Sample code	Samples	Brand	Product type/ category	Pack size	Country of origin	Batch code	Best before/ use by date	Date purchased/ sampled	Place of purchase
AA02853	Campino strawberries & cream	Storck	Boiled	140g	Germany	C37K	05.01	06.01.01	Blackhorse Road Underground Station Newsagent
AA02855	Saint Simons kola cubes	Som's	Boiled	150g	Not declared	L02100S	02/05/2002	10.12.00	Food & Wine
AA03034	Justfruit pastilles	Bassett's Fundays	Jelly	200g	Not declared	LL0239	08 2001	22.01.01	Star Service Station
AA03135	Teddy bears	Kandi Bag	Jelly	200g	Not declared	LL0339-A	Sep 2001	01.02.01	Netto
AA03136	Mallow mania	Haribo Dulcia	Mallow	200g	Belgium	L334	11-2001	25.01.01	Sainsbury's
AA03140	Sherbert cocktails	Sainsbury's	Miscellaneous	250g	UK	L0312 04	Nov 2001	25.01.01	Sainsbury's
AA03141	Sour strawberry mallows	Sainsbury's	Mallow	100g	Netherlands	LH0264ED	09-2001	25.01.01	Sainsbury's
AA03142	Fruit medley	Sweet 'n' low	Boiled	60g	UK	0229	16 Mar 2002	25.01.01	Sainsbury's
AA03144	Original Sports mixture fruit flavour gums	Lion	Hard gum	215g	Not declared	L0346	Dec 2001	25.01.01	Sainsbury's
AA03145	Mini babies	Churchill's Snack Foods Ltd.	Jelly	90g	Not declared	L033P SW16	Nov 2001	24.01.01	Spar
AA03146	Mega mix	Churchill's Snack Foods Ltd.	Jelly	87g	Not declared	MN280 SW16	Jan 2002	24.01.01	Spar
AA03147	Fruit chews	Sainsbury's	Miscellaneous	250g	UK	0285	Apr 01	25.01.01	Sainsbury's
AA03148	Chewy mix	Bassett's & Beyond	Miscellaneous	180g	Not declared	LC0240-N	05-2001	25.01.01	Sainsbury's
AA03149	Jumbo jelly beans	Sainsbury's	Miscellaneous	120g	UK	LL0348-P	Nov 2001	25.01.01	Sainsbury's
AA03150	Chewit chunks	Leaf	Miscellaneous	200g	Not declared	Oct 01B	Oct 01	25.01.01	Sainsbury's
AA03151	Fruity frogs	Sweet Ideas	Jelly	220g	Not declared	30/06/2001	30/06/2001	29.01.01	Darwin Nursery
AA03152	Apple twists	Sainsbury's	Miscellaneous	100g	Not declared	L-H-0266	Sep 2001	25.01.01	Sainsbury's
AA03153	Starburst X factor	Starburst	Jelly/ foam	200g	Not declared	UP038C2	16.06.01	25.01.01	Sainsbury's
AA03154	Toffee fruit swirls	Sainsbury's	Miscellaneous	250g	UK	0354	Jun 01	25.01.01	Sainsbury's
AA03155	Candy bananas	Sweet Ideas	Mallow	150g	Not declared	11/10/2001	11/10/2001	29.01.01	Darwin Nursery
AA03156	Pear drops	Sweet Ideas	Boiled	220g	Not declared	30/06/2001	30/06/2001	29.01.01	Darwin Nursery
AA03241	Love hearts	Swizzels	Miscellaneous	50g	England	MAR 02	MAR 02	09.02.01	Tesco
AA03242	Sparkling fruit drops	Tesco	Boiled	250g	Not declared	1002	Dec 01	09.02.01	Tesco
AA03243	Liquorice comfits	Marks & Spencer	Liquorice	113g	UK	15.05.01B	15.05.01	09.02.01	Marks & Spencer
AA03244	Fruit crumbles	Marks & Spencer	Miscellaneous	200g	UK	10.04.01	10.04.01	09.02.01	Marks & Spencer
AA03245	Fruit jellies	Waitrose	Jelly	250g	UK	LM0319-A	15 Aug 2001	09.02.01	Waitrose
AA03246	Jellyatics	Barnack	Jelly	200g	Not declared	LL0291P	Oct 2001	09.02.01	Tesco
AA03247	Scary mix - fruit flavour gummy shapes	Tesco	Jelly	60g	Germany	L10191	Dec 2001	09.02.01	Tesco
AA03662	Sour burst	Starburst	Jelly	200g	Czech Republic	CZ5B2	04/08/01	09.02.01	Forbuoys
AA03985	Pear drops	Bassett's Fundays	Boiled	200g	Not declared	LE0243-P	02-2002	05.05.01	Churchend Convenience Store
AA03986	Mega power rolls shocker sour candies	Mega Shocker	Miscellaneous	51g	Spain	L125F03B	04.05.02	05.05.01	S & M Newsagent
AA03987	Glacier fruits	Fox's	Boiled	50g	Not declared	L039D1	01 09 01	05.05.01	S & M Newsagent
AA03988	Millions orange & lemon	Millions	Miscellaneous	75g	Not declared	03201	end Jan 2003	05.05.01	Select & Save
AA03990	Dolly Mix	Bassett's & Beyond	Miscellaneous	190g	Not declared	LM1 031	10 2001	07.05.01	Bottisham Costcutter
AA03991	Sweetshop Favourites	Bassett's	Boiled	200g	Not declared	LE1 076-A	12-2001	07.05.01	Country Stores
AA03992	Sherbert lemons	Bassett's Fundays	Miscellaneous	193g	Not declared	LD0205-A	01-2002	07.05.01	Country Stores
AA03993	Strawberry flavour laces	Malaco	Miscellaneous	100g	Denmark	C410233	01 05 02	07.05.01	Lusher News

Table 2: Supplementary analysis by an independent laboratory

Notes: Analytical data (mg/kg) are for ground aliquots of the same samples analysed independently by Eurofins Scientific & RSSL; # duplicate analysis typically conducted on every tenth analytical sample in a batch, as part of the quality assurance procedure.

Sample code	Laboratory	Tartrazine E102	Quinoline Yellow E104	Sunset Yellow E110	Carmoisine E122	Ponceau 4R E124	Allura Red E129	Patent Blue V E131	Indigo Carmin E132	Brilliant Blue E133	Green S E142	Brilliant Black E151
AA02683	Eurofins		4	3	7							
	RSSL		6;6#	3;3#	7;8#						<2;<2#	
AA03136	Eurofins		62		<1	14	<1	4				
	RSSL		96;99#		<2;<2#	18;18#		5;5#				
AA03144	Eurofins		18	5	6						1	
	RSSL		27;29#	6;6#	4;4#						<2;<2#	
AA03148	Eurofins		14		18	3	15					
	RSSL		16;16#		16;16#	2;3#	11;11#					
AA03149	Eurofins		17	3	14							
	RSSL		25	5	17							
AA03153	Eurofins		17	7			11			1		
	RSSL		19;19#	5;5#			9;9#			<2;<2#		
AA03156	Eurofins	12			11							
	RSSL	6			11							
AA03246	Eurofins		13	4	3							
	RSSL		17	3	3							
AA03662	Eurofins		13	8		3	12			1		
	RSSL		19	9			14			<2		
AA03985	Eurofins		58		4							
	RSSL		81		4							

Table 3: Confirmatory data for samples with colour in excess of the permitted limit of 50 mg/kg

Samples were those that contained more than the legal limit for E110 and E122 of 50 mg colour/kg, after taking into account variability in the analysis of samples in the survey. Confirmatory analysis was carried out in duplicate on the ground samples originally analysed. The results of confirmatory analysis are shown, together with figures in parentheses for the original assays. Results are in mg/kg.

Sample code	Sample	Brand	Product type	Sunset Yellow E110	Carmoisine E122
AA02638	Fluffy stuff cotton candy floss	Charms	Miscellaneous	99	
				100	
				(106)	
AA02721	Campino oranges and cream	Storck	Boiled	61	
				63	
				(60)	
AA02831	Campino oranges & cream	Storck	Boiled	73	
				68	
				(70)	
AA02837	Strawberry bricks	Ginni's	Miscellaneous		58
					65
					(61)
AA02855	Saint Simons kola cubes	Som's	Boiled		70
					66
					(61)

Table 4: Results of analysis for artificial colours (mg/kg)

Notes: nd = not detected (limit of detection = 0.5 mg/kg, limit of quantification = 2 mg/kg), NA = not analysed; levels described as <2 mg/kg were detected but not quantified, i.e. between 0.5 mg/kg and 2 mg/kg; # duplicate analysis typically conducted on every tenth analytical sample in a batch, as part of the quality assurance procedure; † total level of colours in the same batch are summed; total colour for each sample was calculated using the sum of actual data. (e.g. 19.2 + 2.1 =21).

Sample code	Samples	Tartrazine	Quinoline Yellow	Sunset Yellow	Carmoisine	Ponceau 4R	Allura Red	Patent Blue V	Indigo Carmine	Brilliant Blue	Green S	Brilliant Black	Total
		E102	E104	E110	E122	E124	E129	E131	E132	E133	E142	E151	
AA02578	Pico-Balla liquorice allsorts	nd	21	11	11	nd	24	22	nd	nd	nd	nd	89
AA02585	American hard gums	nd	19	nd	6	nd	nd	nd	nd	nd	<2	nd	26
AA02586	Apple squiggly worms	nd	200	nd	nd	nd	nd	10	nd	nd	nd	nd	210
AA02587	Tropifruit fruit flavoured gums	nd	21	3	nd	14	nd	nd	nd	nd	<2	nd	38
AA02597	Trolli Dracula	nd	nd	nd	nd	nd	103	nd	nd	nd	nd	nd	103
AA02606	Teddy bears	nd	4; 4 #	5; 4 #	7; 7 #	nd	nd	nd	nd	nd	nd	nd	16; 15 #†
AA02620	Fruity soft centres	nd	nd	nd	12; 12 #	nd	nd	nd	<2; <2 #	nd	nd	nd	13; 13 #†
AA02621	Wine gums	nd	nd	nd	nd	nd	nd	nd	2	nd	nd	nd	2
AA02632	Lemon bon bons	nd	42	nd	nd	nd	nd	nd	nd	nd	nd	nd	42
AA02635	Football mix	nd	8	2	nd	11	nd	nd	nd	nd	nd	nd	22
AA02636	Original midget gems	nd	17	6	4	nd	nd	nd	nd	nd	nd	nd	27
AA02637	Midget gems	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
AA02638	Fluffy stuff cotton candy floss	nd	nd	106	nd	nd	25	nd	nd	27	nd	nd	159
AA02642	Fruit drops	<2	2	4	14	nd	nd	nd	nd	<2	nd	nd	22
AA02643	Astra Kid starch gums	nd	13	5	9	nd	nd	nd	nd	nd	nd	nd	27
AA02644	A. B. C.	nd	33	7	11	nd	nd	<2	nd	nd	nd	nd	52
AA02647	Fruit drops – fruit flavoured boiled sweets	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
AA02649	Mini jelly babies – fruit flavoured gums	nd	14	nd	nd	nd	nd	nd	nd	nd	nd	nd	14
AA02650	Fruit pastilles	nd	nd	5	nd	10	nd	nd	3	nd	nd	nd	18
AA02677	Jelly babies	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
AA02678	Jelly babies	nd	4	7	2	nd	nd	nd	nd	nd	nd	nd	12
AA02679	Jelly beans	nd	22; 22 #	53; 53 #	nd	39; 38 #	nd	<2; <2 #	nd	nd	nd	nd	115; 114 #†
AA02680	Joosters jelly beans	nd	77	nd	nd	3	37	nd	nd	5	nd	nd	122
AA02681	Dolly mixtures	nd	61	nd	<2	nd	nd	nd	<2	nd	nd	nd	64
AA02682	Original gourmet jelly bean - fruit bowl flavours	23	nd	8	nd	nd	24	nd	<2	5	nd	nd	61
AA02683	Wine gums	nd	6; 6#	3; 3#	7; 8#	nd	nd	nd	nd	nd	<2; <2#	nd	17; 18#†
AA02684	Foam shrimps fruit flavour candy	nd	nd	nd	nd	41	nd	nd	nd	nd	nd	nd	41
AA02685	Clear fruits	nd	58	18	12	nd	nd	nd	nd	nd	nd	nd	88
AA02687	Jelly beans	nd	17	4	15	nd	nd	nd	nd	nd	nd	nd	36
AA02688	Bananas	nd	123	nd	nd	nd	nd	nd	nd	nd	nd	nd	123
AA02689	Fried eggs	nd	nd	5	nd	nd	nd	nd	nd	nd	nd	nd	5
AA02690	Chewies – juicy apple	nd	52; 53 #	nd	nd	nd	nd	2; 3 #	nd	nd	nd	nd	55; 55 #†
AA02691	Cola cubes	nd	nd	35	nd	18	nd	nd	nd	nd	nd	nd	54
AA02692	Bon bons – assorted apple, lemon & strawberry flavour chewy sweets	nd	23	nd	nd	nd	nd	nd	nd	nd	nd	nd	24
AA02693	Fruit pastilles	nd	4	nd	nd	nd	nd	nd	nd	nd	nd	nd	5
AA02694	Smilers tropical pastilles	nd	8	17	nd	nd	7	nd	nd	nd	nd	nd	32
AA02695	Glacier fruits	nd	nd	nd	nd	5	nd	nd	<2	nd	nd	nd	7
AA02696	Tweenies fruit flavour shaped jellies	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	Nd
AA02697	Foamy fruits assorted fruit flavour sweets	nd	34	32	nd	19	nd	nd	<2	nd	nd	nd	86

Table 4: Results of analysis for artificial colours (mg/kg) [cont'd]

Notes: nd = not detected (limit of detection = 0.5 mg/kg, limit of quantification = 2 mg/kg), NA = not analysed; levels described as <2 mg/kg were detected but not quantified, i.e. between 0.5 mg/kg and 2 mg/kg; # duplicate analysis typically conducted on every tenth analytical sample in a batch, as part of the quality assurance procedure; † total level of colours in the same batch are summed; total colour for each sample was calculated using the sum of actual data. (e.g. 19.2 + 2.1 =21).

Sample code	Samples	Tartrazine E102	Quinoline Yellow E104	Sunset Yellow E110	Carmoisine E122	Ponceau 4R E124	Allura Red E129	Patent Blue V E131	Indigo Carmine E132	Brilliant Blue E133	Green S E142	Brilliant Black E151	Total
AA02698	Jelly bears – fruit flavoured gums	nd	8	nd	nd	nd	7	nd	nd	nd	nd	9	25
AA02699	Mallow mix fluffy marshmallow pieces	nd	104	nd	nd	nd	57	3	nd	nd	nd	nd	164
AA02700	Original sports mixture fruit flavour gums	nd	16	9	7	nd	nd	nd	nd	nd	nd	nd	33
AA02701	Wise Buys fruit gums	nd	nd	nd	nd	nd	nd	nd	<2	nd	nd	nd	< 2
AA02702	Gummy zingy fruits	nd	64	nd	nd	nd	77	nd	nd	<2	nd	nd	141
AA02703	Polo smoothies	nd	nd	nd	nd	nd	13; 14 #	nd	nd	nd	nd	nd	13; 14 #†
AA02704	Tangtastic	nd	5	2	nd	9	nd	nd	<2	nd	nd	nd	18
AA02705	Fruit assortments	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
AA02706	Banana & strawberry laces	nd	56	nd	19	nd	nd	nd	nd	nd	nd	nd	75
AA02707	Strawberry laces	nd	nd	nd	22	nd	3	nd	nd	nd	nd	nd	25
AA02708	Fizzy blue raspberry flavour laces	nd	nd	nd	nd	nd	nd	70	nd	11	nd	nd	81
AA02709	Dolly mixtures	nd	9	nd	nd	nd	nd	nd	3	nd	nd	nd	12
AA02711	Tangtastic	nd	7	3	nd	9	nd	nd	4	nd	nd	nd	23
AA02712	Fruit assortments	nd	nd	nd	16; 15 #	nd	nd	nd	nd	nd	nd	nd	16; 15 #†
AA02713	Fruit pastilles	nd	nd	9	nd	13	nd	nd	8	nd	nd	nd	30
AA02715	Yorkshire mixture	63; 61 #	nd	nd	nd	nd	50; 48 #	nd	nd	nd	nd	nd	113; 109 #†
AA02716	Teeth and lips	nd	nd	nd	nd	nd	77	nd	nd	nd	nd	nd	77
AA02717	Straws (cola)	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
AA02718	Fruit bon bons	nd	nd	nd	13	nd	nd	nd	<2	nd	nd	nd	14
AA02719	Jelly babies	nd	5	nd	nd	nd	nd	nd	3	nd	nd	nd	7
AA02721	Campino oranges and cream	nd	nd	59; 60 #	nd	nd	nd	nd	nd	nd	nd	nd	59; 60 #†
AA02722	Fun fruits	nd	18	nd	nd	nd	16	1	nd	nd	nd	nd	35
AA02723	Campino strawberries and cream	nd	nd	nd	nd	nd	72	nd	nd	nd	nd	nd	72
AA02724	Joosters	nd	97	nd	nd	6	35	nd	nd	5	nd	nd	142
AA02725	Mallowmix	nd	109	nd	nd	nd	64	3	nd	nd	nd	nd	175
AA02726	Jelly babies	nd	4	nd	nd	nd	nd	nd	<2	nd	nd	nd	5
AA02727	Glucose fruits	nd	nd	nd	nd	nd	64	nd	2	nd	nd	nd	66
AA02728	Smilers	nd	8	22	nd	nd	15	nd	nd	nd	nd	nd	45
AA02729	Jelly babies	nd	25	nd	13	nd	nd	nd	nd	nd	4	nd	42
AA02731	Wine gums	nd	7	nd	nd	nd	nd	nd	<2	nd	nd	nd	8
AA02732	Marshmallows	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
AA02733	Wine gums	nd	24	nd	7	nd	nd	nd	nd	nd	<2	nd	32
AA02734	Chicken Run fruit flavoured shaped jellies	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
AA02735	Midget gems	nd	17	5	4	nd	nd	nd	nd	nd	<2	nd	27
AA02736	Wine gums	nd	5; 5 #	nd	nd	nd	nd	nd	<2; <2 #	nd	nd	nd	6; 6 #†
AA02737	Dolly mixtures	nd	25	54	nd	nd	nd	nd	4	nd	nd	nd	82
AA02738	Dolly mixtures	nd	10	nd	nd	nd	nd	nd	2	nd	nd	nd	12
AA02740	Sweet 'n' Fun family	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd

Table 4: Results of analysis for artificial colours (mg/kg) [cont'd]

Notes: nd = not detected (limit of detection = 0.5 mg/kg, limit of quantification = 2 mg/kg), NA = not analysed; levels described as <2 mg/kg were detected but not quantified, i.e. between 0.5 mg/kg and 2 mg/kg; # duplicate analysis typically conducted on every tenth analytical sample in a batch, as part of the quality assurance procedure; † total level of colours in the same batch are summed; total colour for each sample was calculated using the sum of actual data. (e.g. 19.2 + 2.1 =21).

Sample Code	Samples	Tartrazine E102	Quinoline Yellow E104	Sunset Yellow E110	Carmoisine E122	Ponceau 4R E124	Allura Red E129	Patent Blue V E131	Indigo Carmine E132	Brilliant Blue E133	Green S E142	Brilliant Black E151	Total
AA02741	Sweet 'n' Fun mix	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
AA02744	Lemon bon bons	nd	57; 54#	nd	nd	nd	nd	nd	nd	nd	nd	nd	57; 54 #†
AA02745	Blackcurrant and liquorice	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
AA02746	Jelly babies	nd	9	4	nd	14	nd	nd	<2	nd	nd	nd	28
AA02747	Fruit drops	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
AA02749	Kiddies supermix	nd	18	6	nd	14	nd	nd	15	nd	<2	nd	53
AA02751	Wine gums	nd	18	nd	10	nd	nd	nd	nd	nd	<2	nd	29
AA02752	Fruit pastilles	nd	21	nd	7	nd	nd	nd	nd	nd	<2	nd	29
AA02754	Flumps	nd	91; 87 #	nd	nd	nd	81; 77 #	4; 4 #	nd	nd	nd	nd	176;168 #†
AA02755	Fruit flavour Tweenie shaped jellies	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
AA02756	Christmas Berry fruit (flav) nougat	14	<2	<2	29	nd	nd	nd	nd	nd	6	nd	51
AA02757	Chicken Run fruit flavoured shaped jellies	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
AA02762	Skittles	nd	50	4	nd	15	29	nd	5	nd	nd	nd	103
AA02763	Super Disco's	nd	58	nd	nd	nd	nd	nd	nd	nd	nd	nd	58
AA02766	Rhubarb and custard	10; 10#	nd	nd	nd	nd	7; 7#	nd	nd	nd	nd	nd	17; 17#†
AA02767	Fruit gummies	nd	55	nd	2	25	nd	nd	2	nd	nd	nd	85
AA02768	Fruit assortment	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
AA02769	Soft fruit gums	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
AA02770	Horror mix	nd	2	<2	nd	2	nd	nd	<2	nd	nd	nd	6
AA02772	Jelly lips fruit flavour gums	nd	nd	nd	nd	nd	98	nd	nd	nd	nd	nd	98
AA02773	Strawberry laces	nd	nd	nd	34	<2	3	nd	nd	nd	nd	nd	38
AA02774	Gummy jungle mix	nd	36; 38 #	nd	nd	nd	10; 11 #	nd	nd	nd	nd	nd	47;49 #†
AA02775	Jelly letters assorted fruit flavour gums	nd	20	nd	nd	nd	29	<2	nd	nd	nd	35	85
AA02776	Super sour snakes	nd	20	5	nd	12	nd	nd	9	nd	<2	nd	47
AA02777	Big slice fruit flavoured pops	nd	4	nd	nd	nd	12	nd	nd	3	nd	nd	19
AA02778	Apple flavour laces	nd	183	nd	nd	nd	nd	10	nd	nd	nd	nd	193
AA02779	Candy pencils	nd	nd	nd	15	nd	48	nd	nd	nd	nd	nd	63
AA02780	Justfruit gums	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
AA02781	Fruit pastilles	nd	nd	10; 10 #	nd	11; 11#	nd	nd	6; 6#	nd	nd	nd	27; 27#†
AA02783	Gummy icecream - candy foam jellies	nd	43	nd	43	nd	nd	nd	nd	nd	nd	nd	86
AA02785	Jelly Bean Factory gourmet mix	nd	27	nd	nd	nd	nd	nd	<2	nd	nd	nd	28
AA02786	Mini burger	nd	60	nd	nd	26	nd	<2	nd	nd	nd	nd	87
AA02787	American hard gums	nd	26	nd	24	nd	nd	nd	nd	nd	2	nd	51
AA02788	Wine gums	nd	45	nd	21	nd	nd	nd	nd	nd	10	nd	75
AA02789	Tingling trees	nd	24	nd	nd	nd	nd	nd	nd	nd	nd	nd	24
AA02791	Fruit pastilles	nd	<2	4	nd	15	nd	nd	5	nd	nd	nd	25
AA02792	Skittles	nd	44	4	nd	17	21	nd	6	nd	nd	nd	92
AA02793	Assorted fruit flavour lollipops	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
AA02795	Fizzy neon worms	nd	18	nd	nd	nd	22	<2	nd	nd	nd	nd	42

Table 4: Results of analysis for artificial colours (mg/kg) [cont'd]

Notes: nd = not detected (limit of detection = 0.5 mg/kg, limit of quantification = 2 mg/kg), NA = not analysed; levels described as <2 mg/kg were detected but not quantified, i.e. between 0.5 mg/kg and 2 mg/kg; # duplicate analysis typically conducted on every tenth analytical sample in a batch, as part of the quality assurance procedure; † total level of colours in the same batch are summed; total colour for each sample was calculated using the sum of actual data. (e.g. 19.2 + 2.1 =21).

Sample Code	Samples	Tartrazine E102	Quinoline Yellow E104	Sunset Yellow E110	Carmoisine E122	Ponceau 4R E124	Allura Red E129	Patent Blue V E131	Indigo Carmine E132	Brilliant Blue E133	Green S E142	Brilliant Black E151	Total
AA02796	Jelly tots	nd	nd	5	nd	6	nd	nd	nd	<2	nd	nd	13
AA02797	Build-a-burger	nd	27	29	nd	13	nd	nd	nd	nd	<2	nd	70
AA02798	Ice cream cones	nd	12	nd	nd	nd	10	<2	nd	nd	nd	nd	22
AA02799	Real fruit jellies	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
AA02800	Pokémon fruit flavoured jellies	nd	nd	nd	nd	9	nd	5	nd	nd	nd	nd	14
AA02802	Bob the Builder	nd	nd	nd	nd	nd	3	nd	nd	nd	nd	nd	3
AA02803	Mini jelly babies	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
AA02804	Kiddie's super mix fruit flavour sweets	nd	11	6	nd	12	nd	nd	<2	nd	<2	nd	30
AA02805	Fruit salad	nd	24	6	4	nd	nd	<2	nd	nd	nd	nd	36
AA02808	Strawberries	nd	4	nd	nd	27	177	nd	nd	nd	nd	nd	208
AA02809	Dolly mixture	nd	8	nd	nd	nd	nd	nd	4	nd	nd	nd	12
AA02810	Fruit gums	nd	nd	8	2	10	nd	nd	6	<2	nd	nd	27
AA02811	Fruit bon bons	nd	nd	nd	14	nd	nd	nd	<2	nd	nd	nd	16
AA02813	Marsh mallows	nd	18	21	nd	12	nd	nd	nd	nd	nd	nd	51
AA02814	Gummy zingy fruits	nd	36	nd	nd	nd	114	nd	nd	<2	nd	nd	151
AA02815	Millions cola	nd	nd	nd	nd	nd	133	nd	nd	nd	nd	nd	133
AA02816	American hard gums	nd	5	7	6	nd	nd	nd	nd	nd	nd	nd	18
AA02817	Jelly babies	nd	6	nd	nd	nd	nd	nd	3	nd	nd	nd	9
AA02818	Blackcurrants & raspberries	nd	nd	nd	39	18	nd	nd	nd	nd	nd	nd	57
AA02819	Peach rings	nd	9	5	5	nd	nd	nd	nd	nd	nd	nd	19
AA02820	Fruit sherberts	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AA02822	Wine gums	nd	38	nd	19	nd	46	nd	nd	nd	5	nd	108
AA02823	Original fruits	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AA02824	Kiddie's super mix fruit flavour sweets	3; 3#	10; 11#	14; 13#	nd	13; 14#	nd	nd	9; 9#	nd	<2; <2#	nd	50; 50#†
AA02825	Fantasy mix - fruit flavour & sweet foam gum	nd	12	7	nd	35	nd	nd	<2	nd	<2	nd	56
AA02826	Tropifruitti - tropical fruit flavour gums	nd	22	5	nd	12	nd	nd	nd	nd	<2	nd	40
AA02827	Fruitta – soft fruit pastilles	nd	18	4	nd	13	nd	nd	nd	nd	<2	nd	36
AA02828	Pear drops	nd	64	nd	4	nd	nd	nd	nd	nd	nd	nd	68
AA02829	Sweetstars fruit drops	nd	6	nd	14	nd	nd	nd	nd	nd	<2	nd	21
AA02830	Strawberry bon bons	nd	nd	nd	nd	6	12	nd	nd	nd	nd	nd	18
AA02831	Campino oranges & cream	nd	nd	70	nd	nd	nd	nd	nd	nd	nd	nd	70
AA02832	Chewies - soft chews	nd	44; 44#	nd	nd	nd	nd	2; 3#	nd	nd	nd	nd	46; 47#†
AA02833	Mega power rolls shocker sour candies	nd	nd	nd	nd	nd	86	nd	nd	3	nd	nd	89
AA02834	Mega sour heads megamix	nd	<2	<2	4	nd	nd	<2	nd	nd	nd	nd	7
AA02835	Marshmallows	nd	nd	nd	nd	32; 32#	nd	nd	nd	nd	nd	nd	32; 32#†
AA02837	Strawberry bricks	nd	nd	nd	61	21	8	nd	nd	nd	nd	nd	90
AA02838	Marshmallows	nd	66	nd	nd	9	nd	4	nd	nd	nd	nd	79
AA02839	Midget gems - fruit flavour gums	nd	nd	nd	nd	nd	nd	nd	<2	nd	nd	nd	1
AA02840	Taz gummy	nd	nd	25	23	nd	nd	nd	nd	nd	nd	nd	47
AA02841	Millions strawberry	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
AA02842	Daffy gummy - fruit flavoured jelly foam shapes	nd	nd	40	10	nd	nd	2	nd	nd	nd	nd	52

Table 4: Results of analysis for artificial colours (mg/kg) [cont'd]

Notes: nd = not detected (limit of detection = 0.5 mg/kg, limit of quantification = 2 mg/kg), NA = not analysed; levels described as <2 mg/kg were detected but not quantified, i.e. between 0.5 mg/kg and 2 mg/kg; # duplicate analysis typically conducted on every tenth analytical sample in a batch, as part of the quality assurance procedure; † total level of colours in the same batch are summed; total colour for each sample was calculated using the sum of actual data. (e.g. 19.2 + 2.1 =21).

Sample Code	Samples	Tartrazine E102	Quinoline Yellow E104	Sunset Yellow E110	Carmoisine E122	Ponceau 4R E124	Allura Red E129	Patent Blue V E131	Indigo Carmine E132	Brilliant Blue E133	Green S E142	Brilliant Black E151	Total
AA02844	Fried eggs	nd	14	3	nd	nd	nd	nd	nd	nd	nd	nd	17
AA02845	Fried eggs - candy foam jellies	nd	<2	17	nd	nd	nd	nd	nd	nd	nd	nd	19
AA02846	Alligators	nd	54	<2	nd	nd	nd	<2	nd	nd	nd	nd	57
AA02848	Nougat	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
AA02851	Fruit drops	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
AA02852	Fruit pastilles	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
AA02853	Campino strawberries & cream	nd	nd	nd	nd	nd	75	nd	nd	nd	nd	nd	75
AA02855	Saint Simons kola cubes	3	nd	nd	61	nd	nd	nd	nd	nd	nd	nd	64
AA03034	Justfruit pastilles	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
AA03135	Teddy bears	nd	9	7	6	nd	nd	nd	nd	nd	<2	nd	23
AA03136	Mallow mania	nd	96; 99#	nd	<2; <2#	18; 18#	nd	5; 5#	nd	nd	nd	nd	120; 124#†
AA03140	Sherbert cocktails	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AA03141	Sour strawberry mallows	nd	nd	nd	nd	nd	81	nd	nd	nd	nd	nd	81
AA03142	Fruit medley	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
AA03144	Sports mixture fruit flavour gums	nd	27; 29#	6; 6#	4; 4#	nd	nd	nd	nd	nd	<2; <2#	nd	39; 40#†
AA03145	Mini babies	nd	15; 15#	8; 7#	3; 3#	nd	nd	nd	nd	nd	<2; <2#	nd	27; 25#†
AA03146	Mega mix	nd	13; 13#	1; 1#	<2; <2#	8; 8#	nd	<2; <2#	nd	nd	nd	nd	25; 25#†
AA03147	Fruit chews	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
AA03148	Chewy mix	nd	16; 16#	nd	16; 16#	2; 3#	11; 11#	nd	nd	nd	nd	nd	45; 46#†
AA03149	Jumbo jelly beans	nd	25	5	17	nd	nd	nd	nd	nd	nd	nd	48
AA03150	Chewit chunks	nd	15	nd	nd	nd	nd	nd	nd	22	nd	8	45
AA03151	Fruity frogs	nd	2	nd	nd	nd	nd	<2	nd	nd	nd	nd	3
AA03152	Apple twists	nd	109	nd	nd	nd	nd	7	nd	nd	nd	nd	116
AA03153	Starburst X factor	nd	19; 19#	5; 5#	nd	nd	9; 9#	nd	nd	nd	<2; <2#	nd	33; 34#†
AA03154	Toffee fruit swirls	nd	nd	nd	nd	nd	nd	nd	nd	<2	nd	nd	1
AA03155	Candy bananas	nd	75	nd	nd	<2	nd	nd	nd	nd	nd	nd	76
AA03156	Pear drops	6	nd	nd	11	nd	nd	nd	nd	nd	nd	nd	17
AA03241	Love hearts	nd	<2	26	nd	7	nd	nd	3	nd	nd	nd	37
AA03242	Sparkling fruit drops	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
AA03243	Liquorice comfits	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AA03244	Fruit crumbles	nd	<2	nd	nd	nd	nd	nd	nd	nd	nd	nd	1
AA03245	Fruit jellies	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
AA03246	Jellyatics	nd	17	3	3	nd	nd	nd	nd	nd	nd	nd	23
AA03247	Scary mix - fruit flavour gummy shapes	nd	11	nd	nd	nd	19	<2	nd	nd	nd	37	69
AA03662	Sour burst	nd	19	9	nd	nd	14	nd	nd	<2	nd	nd	43
AA03985	Pear drops	nd	81	nd	4	nd	nd	nd	nd	nd	nd	nd	85
AA03986	Mega power rolls shocker sour candies	nd	nd	nd	nd	nd	40	nd	nd	13	nd	nd	52
AA03987	Glacier fruits	nd	nd	nd	nd	6	nd	nd	<2	nd	nd	nd	6
AA03988	Millions orange & lemon	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
AA03990	Dolly Mix	nd	3	nd	nd	nd	nd	nd	3	nd	nd	<2	6
AA03991	Sweetshop Favourites	nd	35	nd	6	4	nd	nd	nd	nd	nd	nd	45
AA03992	Sherbert lemons	nd	73	nd	nd	nd	nd	nd	nd	nd	nd	nd	74
AA03993	Strawberry flavour laces	nd	nd	nd	12	nd	208	nd	nd	nd	nd	nd	219

Table 5: Levels of colours not listed on labels (mg/kg)

Notes: Limit of detection = 0.5 mg/kg; limit of quantification = 2 mg/kg; # duplicate analysis typically conducted on every tenth analytical sample in a batch, as part of the quality assurance procedure.

Sample code	Tartrazine E102	Quinoline Yellow E104	Sunset Yellow E110	Carmoisine E122	Allura Red E129	Patent Blue V E131	Indigo Carmin E132	Brilliant Blue E133	Green S E142	Brilliant Black E151
AA02644		33								
AA02707					3					
AA02708								11		
AA02756									6	
AA02767				2			2			
AA02773					3					
AA02805				4						
AA02808					177					
AA02819			5							
AA02824	3;3#									
AA02837				61						
AA02838						4				
AA02855	3									
AA03150										8

ANNEX 1 WRITTEN COMMENTS RECEIVED FROM COMPANIES

The comments in this Annex were sent by the companies named below to the Food Standards Agency in response to their being notified of results for samples of sweets that they supply.

Sample Code AA02638

From: Tootsie Roll Industries, Inc., Chicago, Illinois

'I was asked to respond to Dr. Lucy Foster's letter concerning the presence of sunset yellow (E 110) or FD&C Yellow 6 in Fluffy Stuff Cotton Candy.

Charms, for the last year and half, has not used any sunset yellow in the production of Fluffy Stuff Cotton Candy. It is true, FD&C Yellow 6 is in the ingredients legend, but will be removed as new packaging is produced. In any event, FD&C Yellow 6 is not in the product. Therefore, the level of FD&C in the product should be <50ppm or below detection.

It is hard for us to comprehend finding sunset yellow in some of the Fluffy Stuff Cotton Candy, unless, the product the Food Standards Agency evaluated was old.'

Sample Codes AA02707 & AA02708

From: Safeway Stores plc, Hayes, Middlesex

'Safeway was very disappointed to learn that undeclared colours were found to be present in two of our confectionery products tested in this survey.

Although these results are not a concern for consumer safety, they have identified a weakness in the manufacturing practices of our supplier. As a consequence, a number of products from this factory have been withdrawn from sale. Further production has been stopped until improved practices and controls have been put in place.'

Sample Code AA02721 & AA02831

From: Storck, Winchester, England

'When Storck launched Campino Orange & Cream in May 2000 the manufacturing technology for the product was new. Manufacturing involves the production of two sugar candy mixes, an orange candy mix containing the colour sunset yellow (E110) and a cream candy mix, which are dosed by means of a conical feeder to create a striped product. The uniform distribution of the two mixes requires exact dosing of the two constituents.

We were alerted to an issue of uneven distribution of the orange and cream mix that resulted in slightly high levels of sunset yellow (E110) in some of the sweets produced at the early production stages of this product and took immediate action to compensate for the dosing fluctuations. The extent of the dosing fluctuations exceeded our initial pre-production calculations. The samples analysed during this Food Standards Agency survey were from product produced at the very early stages of production.'

Sample Code AA02767

**From: Herr Faude (Marketing Director), Mederer Süswarenvertriebs GmbH,
Oststrasse 94, D – 90763 Fürth/Bay., Germany**

'We have today received the analysed complained product 09 05 02 which supposed to have not declared E-Numbers.

The result of the institute of the German Confectionery Quality in Cologne confirmed that the analysed product of the company Iceland which we are producing at on Gummi Bear Factory plant in Boizenburg didn't contain any E 122 Azorubin and E 132 Indigotin. The method of analysis was HPLC; (Diodenarraydetektion) – attached: instruction of analysis for colours.

We also would like to mention that Gummi Bear Factory is not using at all any of these colours in the factory for any other production.'

**From: H. Burkhardt (Food Chemical), Institute of the German Confectionery Quality,
Köln, Germany**

'With the letter of 26.2.2002 and 29.2.2002 we received on 27.2.2002 and 1.3.2002 from Gummi Bear Factory in Boizenburg 3 different gummi candies to be analysed for synthetic food colours E 122 and E 132, resp. contained quantities.

Our analysis results are resumed in the annex.

As we had in the bag different articles and also different colours – gummi and gummi foam items, we didn't take out something of each bag for a complete mix but concentrated on the pieces with colours red, blue-black, green and orange.

Through this type of analysis we have a higher sensibility of proof of any substances. Both relevant colours E 122 and E 132 have not been found in any of these 3 samples.'

Anlage zu unserem Schreiben vom 06.03.2002

Analysenergebnisse:

Bezeichnung der Probe	IQ.Nr.	Synthetische Lebensmittelfarbstoffe <u>HPLC: Diodenarraydetektion)</u>	
		E122 Azorubin	E132 Indigotin I
Fruit Gummies, Glimmi Candy, 99 p, e 350g			
-MHD 08.05.02	02.0261	n.n.	n.n.
-MHD 09.05.02	02.0262	n.n.	n.n.
-MHD 09.05.02 (Rückstellmuster Kunde)	02.0266	n.n.	n.n.
Retained customer samples			

n.n. = nicht nachweisbar = <0.05 mg Farbstoff/kg

[FSA note: Levels detected in the survey were at the limit of quantification (2mg/kg)]

Sample Code AA02819

From: Chelsea Foods Ltd., Rainham, Essex

'Thank you for your letter dated 18 February explaining your analysis on the above product. Firstly, I wish to make it clear that we do not manufacture confectionery. This particular product is purchased from an importer.

On checking our records, I can confirm that the printing plates for the ingredients contained in this product were produced in accordance with the information we were supplied with by the importers (a copy of their fax is enclosed).

We are now producing a revised ingredients list and will ensure that any further stock we sell is printed with the correct ingredients list.'

Fax referred to above:

'Raspberries 4 x 3 kg

Ingredients. Corn Syrup, Sugar Water, Gelling Agents. Modified Starch, Gelatin Acid: Citric Acid. Flavourings. Colours. E 104 E 122 E 131

Peachs 4 x 3 Kg

Ingredients: Sugar Corn Syrup Water
Gelatin Acid: Citric Acid
Flavours. Colours. E104 E122 E124'

Sample Code AA02824

From: Dunhills (Pontefract) plc, Pontefract, West Yorkshire

'Dunhills (Pontefract) plc were keen to investigate after an external analysis of one of our products sold in late 2000 revealed an additive which was not declared on our packaging. This followed previous analysis in January 2000 by West Yorkshire Trading Standards, which had found no such trace.

The analysis found an additive called Tartrazine, a permitted colour in confectionery sold in the UK up to a level of 300mg/kg. Levels found in the analysis were 100 times below that legal limit, at 3mg/kg. There was no risk to the health of our valued customers.

Tartrazine is not used in our products intended for the European market, but is permitted for use in Canada. Our records show that, in May 2000, an order was produced and packed for Canada, leaving a small remainder of confectionery after packing. We believe this surplus was mistakenly packed into European product. Controls on export material have since been tightened and we are satisfied that this error could not happen again.

The batch in question was well past its 'best before' date and is no longer on the market. We have received no other complaints regarding this, or any other related batch.'

[Analysis of this sample was completed before the 'best before' date expired]

Sample Codes AA02837 & AA02838

From: Ginni Enterprises Ltd., Southall, Middlesex

'Thank you for your letter of 18th Feb. 2002 concerning colours present in Ginni's products namely Strawberry Bricks and Marshmallow. Upon your request I would like to make the following comments:

1. Strawberry bricks: We as a packer usually check all the information given by the supplier prior over printing them on the label. In this instance it seems this item was missed in printing. Further, it was only a small quantity (0.5MT Max.) of the product packed as a trial, but our salesmen found it very unpopular, thus we discontinued the item since 2001.
2. Marshmallow: Thank you for bringing this matter to our attention and would like to ascertain you that the printing for the next batch would be complete and complied. Meanwhile we are also waiting for our supplier's updated information. I am sure you appreciate the time scale we need for the present batch.

Please accept our sincere apology for the above and would like to assure you that we are exercising our due diligence and taking all reasonable precaution to ensure the safety and quality including labeling information of all our products.'

Sample Code AA03150

From: Leaf United Kingdom Ltd., Southport, Merseyside

'Our initial reaction to your letter dated 18th February was that it was impossible to find undeclared E151 in one of our products. This confidence was simply because we do not use it in any of our current products, have never used it in previous products, or indeed have any intentions of using it in future products. The product in question was one of the

few that Leaf manufactured using artificial colours. Investigation revealed that we have no E151 present in our additive dispensary or on any of our current or old material stock lists.

On searching within the R&D facilities, we did however reveal a single sample of E151, but this area is restricted and there is no opportunity for the colour to enter production areas.

We took the decision to check the colouring materials that were in use at the time of the manufacture of the product that you sampled, together with several similarly coded samples from our reference stores. We also requested analysis of the reference sample that was held on your behalf.

The RSSL analysis method was submitted to the testing laboratory at Leatherhead Food Research Association.

I have attached a copy of the analysis report form LFRA in which they found no evidence of E151 in any of the colouring materials or products that were submitted including the reference samples.

This is obviously in contradiction to your findings from RSSL but would seem to further substantiate our initial disbelief at the allegation, ie the fact that we do not use the material in question E151.

We await your response to these findings and are quite willing to assist in any further work that you feel would assist in clarifying the situation. ‘

Test Report

REPORT ON ANALYSIS OF SWEET SAMPLES FOR BRILLIANT BLACK

Received from: Howard Everett
Leaf United Kingdom Ltd
66 Virginia Street
Southport
Merseyside
PR8 6RX

Date analysis started: 1/3/02

Method of analysis: Samples were analysed as specified in the method supplied to us by Leaf UK (being the method supplied to them by the Food Standards Agency). Identification was by comparison of retention time with that of a sample of Brilliant Black supplied by Leaf UK:

Results:

Sample (LFRA reference)	Concentration Brilliant Black
Quinolie yellow (F702)	nd ^a
Brilliant blue ref AH2008 (F703)	nd ^a
Brilliant Blue ref AK9360 (F704)	nd ^a
Chewit Chunx BBE Jul 01D Blue (F705)	nd ^b
Chewit Chunx BBE Jul 01D Green (F706)	nd ^b
Chewit Chunx BBE Oct 01B Blue (F707)	nd ^b
Chewit Chunx BBE Oct 01B Green (F708)	nd ^b
Chewit Chunx BBE Oct 01C Blue (F709)	nd ^b
Chewit Chunx BBE Oct 01C Green (F710)	nd ^b
Chewit Chunx BBE 06 02 A Blue (F711)	nd ^b
Chewit Chunx BBE 06 02 A Green (F712)	nd ^b
Spearmint Chewits (F713)	nd ^b
Extreme apple chews (F714)	nd ^b
Chewit Chunx sample received from Ventress Technical Services Ltd, Blue (F715)	nd ^b
Chewit Chunx sample received from Ventress Technical Services Ltd, Green (F716)	nd ^b

nd^a: limit of detection = 80 g/kg

nd^b: limit of detection = 2 mg/kg