



# **A FOWL PRACTICE: TOO MUCH ADDED WATER AND HYDROLYSED PROTEIN IN CHICKEN BREAST**

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# Water in Chicken

The plastic chicken that's only 51pc meat - *Daily Mail*

May 03

Beef traces found in chicken  
- *BBC News*

Scandal of beef waste in chicken-  
*The Guardian*



2 Surveys & an  
Enforcement Exercise



# FOOD STANDARDS AGENCY

- Established April 2000 as independent Government Department.
- Main role is to protect health of consumer (food safety), i.e. risk assessment and risk management.
- Also has other consumer protection responsibilities – labelling, nutrition



# FOOD AUTHENTICITY PROGRAMME

- Food authenticity programme is one of more than 30 programmes in the Agency involved in research and surveillance.
- Research programme is to develop novel methods to determine misdescription and mislabelling.
- Surveillance programme carried out with local authority inspectors to determine extent of misdescription on UK market.



# Rationale of Agency's Authenticity Programme

- ***Contributes to Agency's objective to promote honest and informative labelling to help consumers make informed choices.***
- ***Assists in the improvement of enforcement of food law and checks compliance with Regulations.***
- ***Supports food labelling policy.***
- ***Identifies and tackles misdescription of foods.***



# WHY ADD WATER TO CHICKEN BREAST?

- Chicken breast most popular portion of chicken – especially for further processing and in catering.
- Chicken breast low in fat, hence ‘dry’ texture on cooking, can lose 10-15% moisture on cooking depending on conditions.
- Water added to chicken breast to retain succulence after cooking.



# WHO USES THIS CHICKEN PRODUCT?

- Relatively small part of total poultry market. Represents 12% of UK imports (£110 million)
- Chicken preparations (with added ingredients) used for further processing and in catering.
- In catering, large use of chicken breast in ethnic restaurants, takeaways, catering service sector. In UK an estimated 20,000 ethnic restaurants (Indian and Chinese) use 60-80,000 tonnes/year.

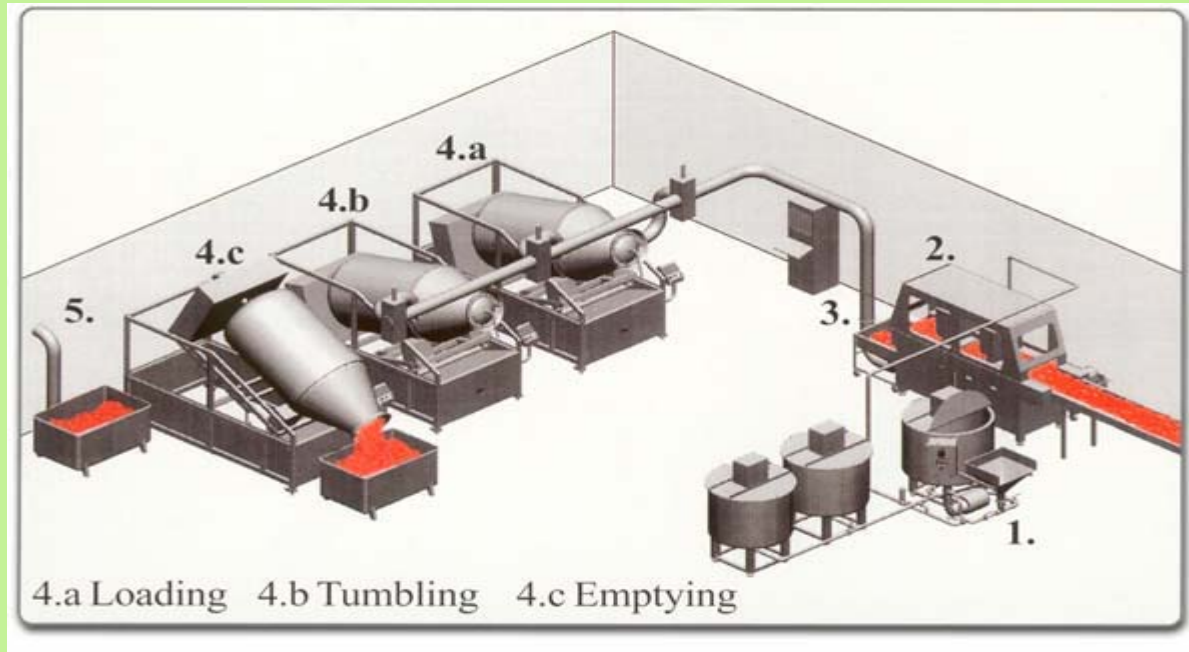
70% of this use is non-EU chicken breast.





# HOW TO ADD WATER TO CHICKEN

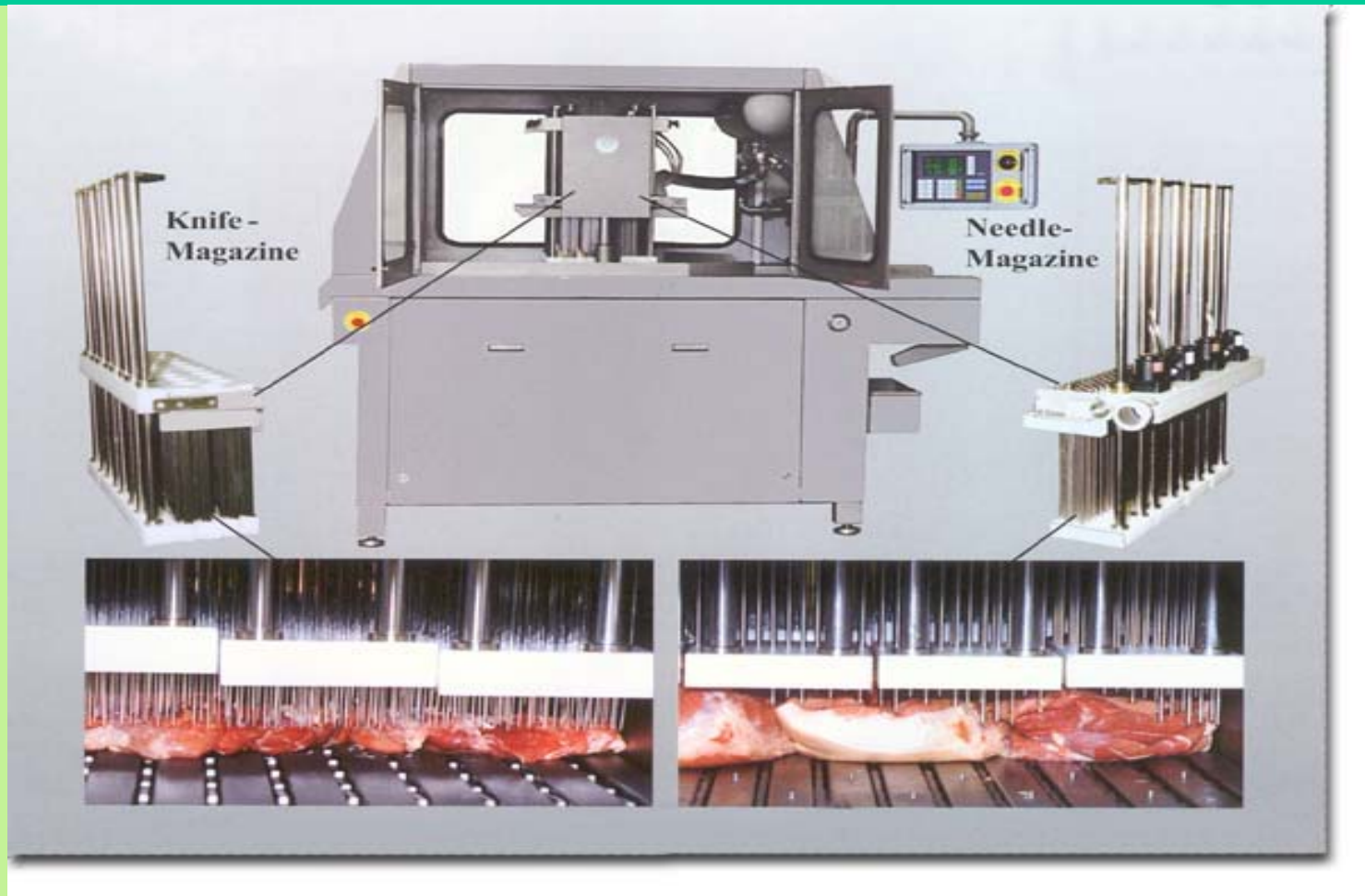
## 1. TUMBLING



- Diffusion process – slow
- Amount of added water limited – usually less than 20%
- Water retained by salts, sugars, polyphosphates



## 2. INJECTION



- Using 3 blocks of needles can double weight of chicken breast in around 40 seconds
- Need hydrolysed collagen protein for freeze/ thaw, cooking



# HOW TO ANALYSE FOR ADDED WATER

- Cannot use Official Method (Water/Protein) with high added water and ingredients such as proteins, sugars
- Use nitrogen as marker for chicken content, and nitrogen factor based scientific study of chicken composition (The Analyst, 2000, 125, 1359-1366) .

**Added water % = 100 - (Apparent Total Chicken Content + Ash + Carbohydrate + Other Ingredients)**

**Apparent Total Chicken Content = Apparent Fat-Free Chicken Content ( Nchicken/Nfactor x 100) + fat.**

Hydroxyproline used as marker for hydrolysed collagen proteins

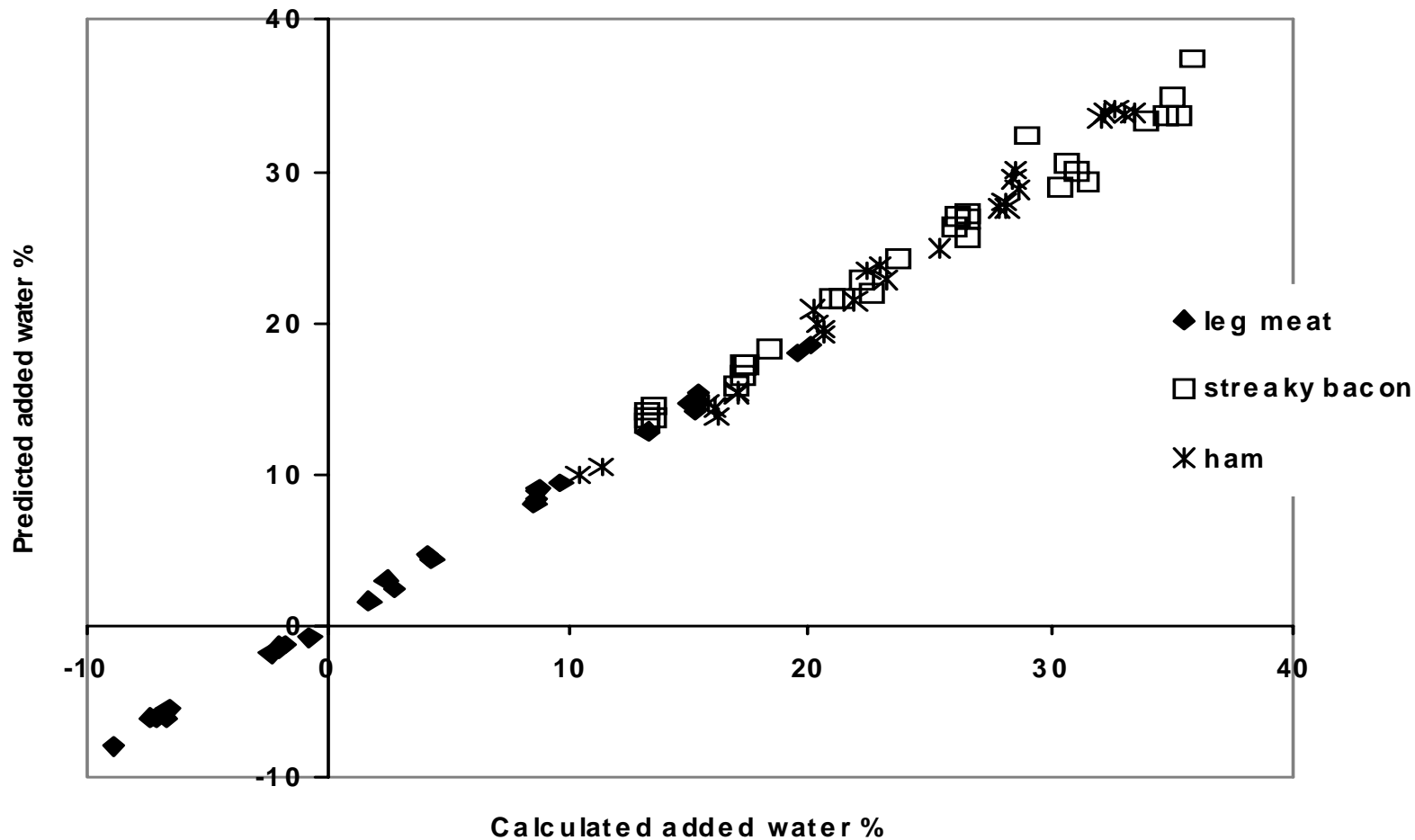
Deduct from chicken nitrogen.



# Microwave Dielectric Spectroscopy

- A measure of permittivity and conductivity under an applied electric field over a range of frequencies.
- The penetration of microwaves in conjunction with spectroscopy offers the potential for novel on-site compositional analysis particularly for added water





**Predicted added water using MDS vs calculated added water for different pork meat cuts**



- Dielectric spectroscopy can provide a rapid measure of added water in food products
- Analytical Neural Network approaches allow improved analysis
- The approach could provide a useful screening tool for on-site real-time analysis for manufacturers retailers and enforcement agencies
- Kent, M., Peymann, A., Gabriel, C., Knight A (2002) Determination of added water in pork products using microwave dielectric spectroscopy. Food Control 13: 143-149

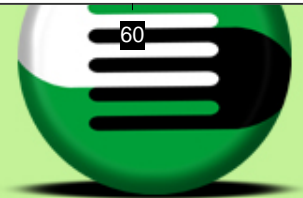
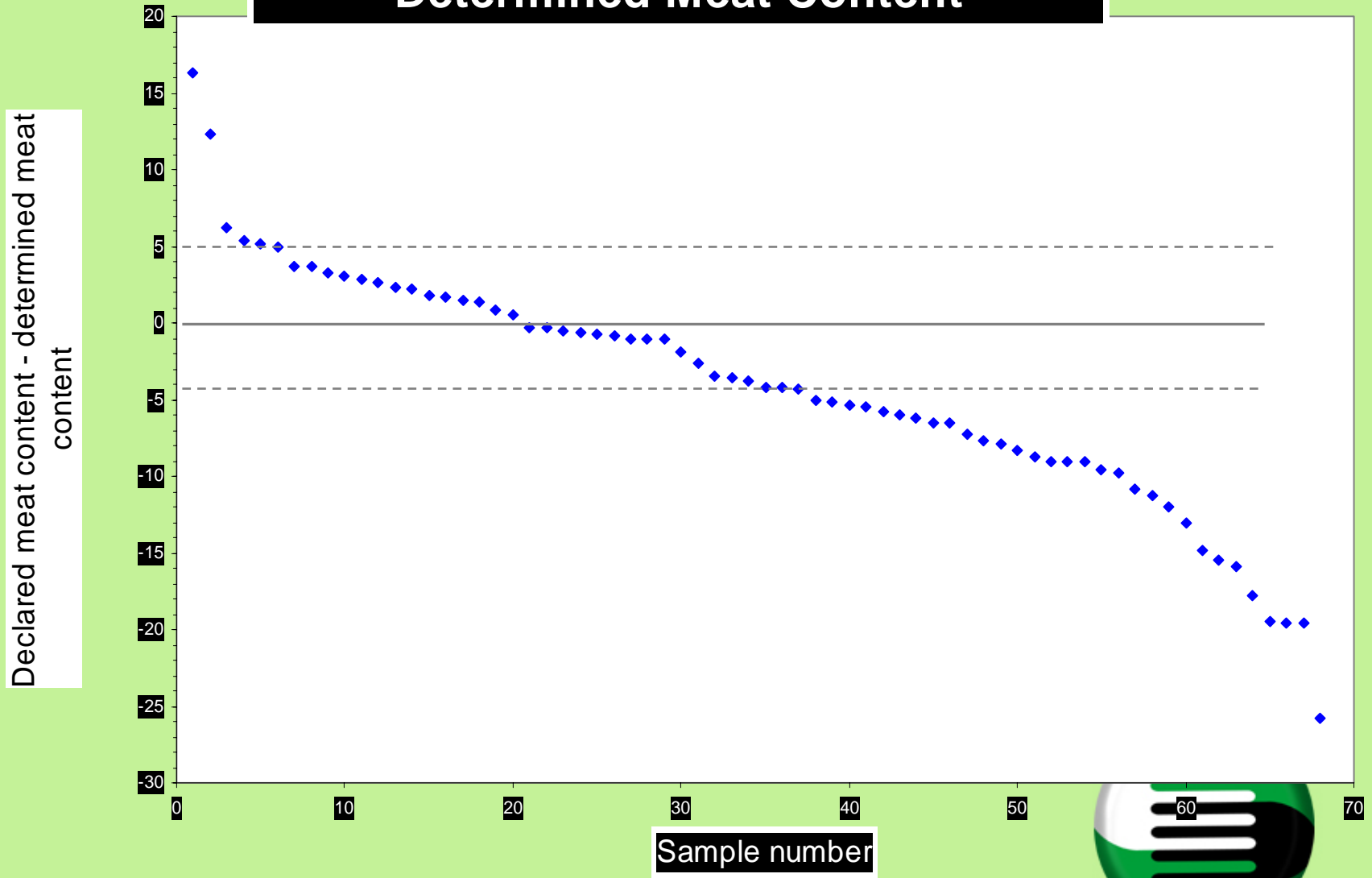


# WATER IN CHICKEN SURVEY (CATERING)

- 68 samples of 10 kg boxes of frozen chicken breast from wholesalers, distribution centres and one production site by 22 local authorities.
- Analysed for meat content and hydroxyproline by 13 Public Analysts. 1 PA also did DNA testing.
- Meat content calculated from data using N factor of 3.85, added water estimated by difference.
- Uncertainty calculated as 2.7% meat content, and  $\pm 5\%$  taken as misdescribed



# Figure 1: Comparison of Declared and Determined Meat Content





# RESULTS

- 31 (46%) samples over-declared chicken content between 5 and 26%.
- Added water estimated from 0 to 43%
- 16 (24%) samples with 0.05 to 0.36 g/100g excess Hyp i.e. correspond to 1.7 and 12% Meat Content.
- 2 samples had ingredients from pork, no beef DNA detected.



# RESULTS

## Other Aspects of Mislabelling:

- Hydrolysed protein not declared even as an ingredient (no species given either)
- Name of food misleading – all labelled as chicken breast or fillets, some as Grade A or Premium
- Many labelled as “Halal Slaughtered”.



# CO-ORDINATED ENFORCEMENT EXERCISE

- 20 Local authorities took 25 formal samples targeting 10 processors (1 UK, 2 Belgian and 7 Dutch)
- Chemical and DNA analyses by PAs using same Irish Laboratory as FSA-Ireland.
- Although formal samples, brand names published March 03.



# CO-ORDINATED ENFORCEMENT EXERCISE

- 15 samples >5% deficient, 9 samples >10% deficient than declared
- 18 used “breast or fillet” as name
- 11 samples +ve for pork DNA, 1 sample +ve for pork and beef DNA, 11 labelled as “Halal”
- 1 Prosecution but other formal cautions



# HOW TO CONTROL PROBLEM

- Pressure on wholesalers by continued surveillance and prosecutions
- Strengthen UK Regulations on labelling meat products
- Liaise with Dutch authorities to improve inspections of companies producing products.
- Lobby European Commission to bring stricter controls or marketing standards.



# FOLLOW-UP ACTION

- New Meat Products Regulations 2003 require “added water” in name and any ingredients from a different species – similar to MPSFPR 1984
- Commission issued Staff Working Document SEC (2004) 1130 in Sept 2004
- FVO visit in April 05 to UK to look at water retention agents reasonably favourable report Dec 05.
- Commission put added water on 2005 EC Co-ordinated Control Programme.



# IMPORTED FOOD PROGRAMME 2004

- 161 Samples collected by 15 Local Authorities
- 115 Samples of frozen chicken breast, 38 chicken products(mainly coated).
- Improvement over 2001 survey in labelling.
- Only 3 samples with 10% or more deficiency in chicken content
- 11 samples containing hydrolysed collagen proteins (1 labelled Halal)
- 2 samples still using Grade A when made with added water.



# WHERE ARE WE NOW?

- Publicity has had an effect on market - move to “drier” chicken breast, Muslims require better certification of Halal.
- 100 samples taken in EC Co-ordinated Programme - some indication of continuing labelling problems.
- Will obtain an EU picture, and whether Commission feels further action necessary





# Late News

## POULTRY DISCOVERY SHOCK

By Our Consumer Affairs Reporter  
**Colonel Sanders**

THERE was shock today after tests on tens of thousands of tonnes of chicken used in the catering trade and take-away shops were found to contain traces of chicken.

"In some cases up to fifty percent of what we tested actually turned out to be actual chicken," said one of the astonished inspectors who carried out the raid. "In some establishments we found proprietors flagrantly ignoring industry guidelines by not pumping their poultry full of water and collagen proteins extracted from cow hides."

However an industry spokesman said these incidents of "real chicken" were confined to an handful of outlets, and said this would have no effect on the vast quantity of rubbery tasteless meat sold to consumers.



