Note 3:
The CSE laboratory: Discrediting the messenger will discredit the study

The soft drink companies raised issues regarding the capability of the CSE laboratory, its methodology, its equipments, its personnel, and its capacities to undertake this research. All these questions in turn raised by the Joint Parliamentary Committee and our replies scrutinised before the committee gave its final verdict:

"The Committee finds that the CSE findings are correct on the presence of pesticide residues in carbonated water strictly in respect of the 36 samples of 12 brand names analysed by them. The Committee also appreciates the whistle blowing act of CSE in alerting the nation to an issue with major implications to food safety, policy formulation, regulatory framework and human and environmental health."

We give below excepts of their report on the capability of the CSE laboratory.

	Questions…	**JPC report and its decisions**
1	CSE has quoted that they have adopted EPA method for organochlorine and organophosphorus insecticides (8081 and 8141). However, they have deviated the column clean-up for pesticide residues wherein they have eluted the column with Hexane and Dichloromethane mixture. In the EPA procedure (3620B) florisil column cleanup is with Ethyl ether and hexane mixture. The rate of elution of column with 5 ml/min of Dichloromethane is too fast and no cleanup is achieved.	The Gas Chromatographic technique is used for qualitative and quantitative analysis of the components of a mixture. According to the given methodology, "the analyst is permitted to modify GC column, GC conditions, concentration techniques (*i.e.* evaporation techniques), internal standards or surrogate compounds". Hexane and dichloromethane mixtures have also been recommended for clean-up. The elution flow rates of the solvents have to be optimised by the analyst. The flow rates etc. given in the method are only indicative.
2.	Soft drinks are a complex matrix. They have many components like sweeteners, coloring agents, preservatives, acids which require extreme care during sample preparation and extraction. Otherwise there is every possibility of non target compounds co-eluting with the target analytes and could cause wrong/overestimated results.	The US EPA method used by CSE for its tests is recommended for determining the concentration of various organochlorine and organophosphorous pesticides in extracts from solid and liquid matrices which include products like soft drinks. CSE is aware of the problems that arise while handling a complex matrix and has always taken the appropriate measures to counter those problems. Scientific methodologies clearly exist for complex materials, and CSE adopted these methodologies.
3.	While carrying out GC analysis, CSE has chosen higher oven temperature ramp (25°C/ min) resulting in higher oven temperature within a shorter period. As very high temperature is reached in shorter duration, there will be poorer resolution of residues and they may get merged into a single peak resulting in higher area and thus showing	The conditions such as carrier gas flow rate, temperature of injector, detector temperature and temperature programme specified in US EPA methodology are indicative and not rigid. They are optimised in actual practice during experiments and may, therefore, vary with column and instrument used.

	higher value for the pesticide residues, whereas in EPA, the temperature rise is 2.8°C/min.	
4.	CSE found malathion while other labs like CFTRI and CFL did not.	Peak of malathion re-detected by ECD and NPD detectors. Reconfirmed by using two columns of different polarity. CSE did another experiment. "So far as non-detection of malathion by the two laboratories (CFTRI and CFL) is concerned, the Committee attributes the same to the variations in different batch numbers, manufacturing locations and also the dates of collection and analysis. The absence of malathion in the Mysore and Kolkata analysis have been scientifically explained by CFTRI."
5.	At sub parts per billion (ppb) detection levels not using the recommended gas (*e.g.* Helium) could affect separation efficiency of the peaks leading to misinterpretation of the results.	In scientific literature, it is well-documented that the carrier gas must be an inert or non-reactive gas. Nitrogen is such an inert or non-reactive gas.
6.	CSE found more pesticide residues compared to other labs like CFRTI and CFL	With regard to the quantitative aspect, the results of CSE on the one hand and CFL CFTRI and CFL, Kolkata on the other vary widely. The Committee has no hesitation in admitting that as explained by different experts who deposed before the Committee, variations in analytical research are a well known factor. In this case, there have undoubtedly been variations in the samples which had different batch numbers and also were manufactured at different locations.

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