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PURPOSIVE LEARNING FOR SUSTAINING HYGIENE FROM UNDESIRED ADMINISTRATION OF ADULTERANTS, HORMONES AND ANTIBIOTICES IN FOOD STUFF

Sibananda Sana* & Dr. Chandan Adhikary**
* Assistant Professor, Government Training College, Hooghly, West Bengal
** Assistant Professor, Institute of Education (P.G) for Women, Chandernagore, Hooghly, West Bengal

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Abstract:

Science brings blessing to the human civilization. But due to open knowledge sharing, evil, corrupt and dishonest minded people use this knowledge of science in their worse business for selfish monetary benefits and turn this blessing of science into curse endangering the today's well developed human race on the Earth. The undesired use of adulterants and indiscriminate application of hormones and antibiotics in the food stuff have serious effect on human health and hygiene. In this study we like to explore the different adulterants, hormones and antibiotics used in different food stuff, their health hazard, possible simple homely detection and awareness building through purposive learning to sustain our healthy living and save the human civilization.

Key Words: Purposive Learning, Hygiene, Adulterants, Hormones, Antibiotics, Simple Homely Detection & Awareness Building.

1. Introduction:

In the progressive globalization and digitalization age knowledge of science and technology, an open property of all, can be used and applied by evil, corrupt and dishonest minded people in their worse business for selfish financial benefits. These undesired actions endanger our existence in the Earth by causing fatal effects on our health and hygiene. These include the use of adulterants and indiscriminate application of hormones and antibiotics in the food stuff. To save the human civilization and sustain our healthy living we need to build awareness against these vile actions and construct strict laws. The best way to build awareness is purposive learning (Figure 1) which emphasizes conscious purposing and planning as the main vehicle to learn (Edward C. Tolman, 1932).

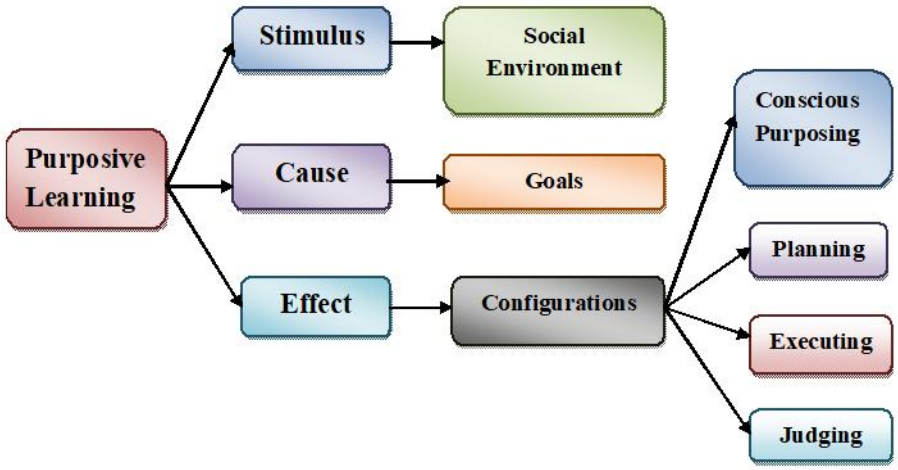

Figure 1: Scheme of Purposive Learning

In the purposive learning, goals and configurations are in a cause-and-effect sequence while the social environment is the stimulus. Nevertheless, from the standpoint of an adequate theoretical understanding of the implications of purposive learning, an analysis of the conscious acts of purposing is not sufficient. It is essential that we know the structure of the indirect changes achieved through the pursuit of goals. It is important to know how purposive behavior affects the basic elements of behavior, how the reflexes, the organic and emotional drives and the other subtle workings of the psychological make-up reorganize themselves within purposive behavior (Rothkopf, E. Z. 1981). The acts of purposive learning follow the scheme of "Purposing, planning, executing and judging". (Kilpatrick, W.H. 1925; Taba, H. 1932). So, on the basis of this theory we need to develop a scheme of purposive learning to build awareness.

2. Scope of Awareness Building for Sustaining Hygiene:

To sustain hygiene from undesired administration of adulterants, hormones and antibiotices in food stuff (Figure 2), there is huge scope and mutual responsibility to build and spread awareness. Such type of awareness building can be sucessfully done by developing suitable purposive learning scheme and fruitfully implement it.

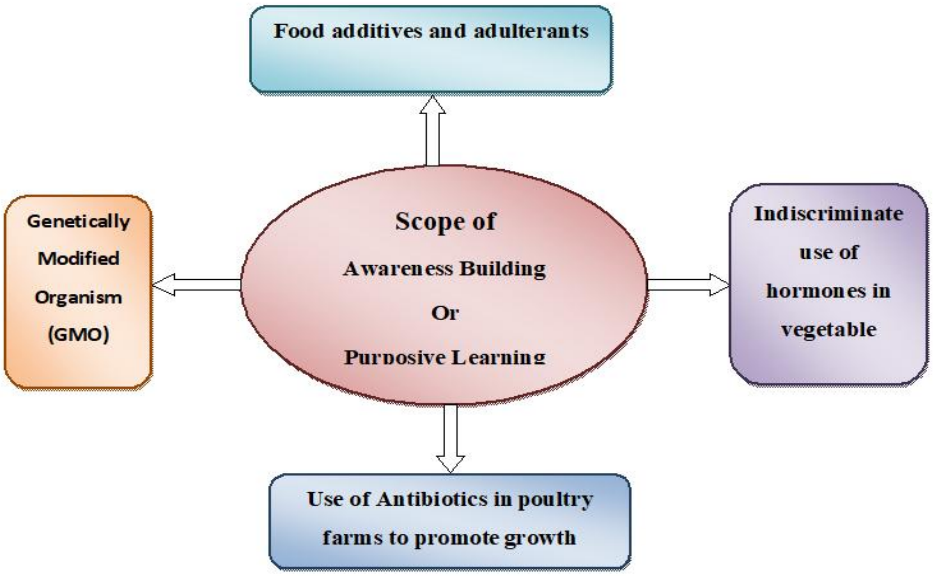

Figure 2: Scope of Awareness Building for Sustaining Hygiene

- ✓ **Food additives and Adulterants:** Food additives are the substances that become the part of a food and make it attractive to consumers. Food additives can be a) colouring agents, b) emulsifiers, c) stabilizers, d) flavouring agents, e) antioxidants etc. Now the additives should be of food grade and used under certain permitted value (level), otherwise food gets adulterated. Every consumer wants to get maximum quantity of commodity in minimum price and on the other hand traders and manufacturers want to maximize their profit. In this contradictory situation, minor material gain renders the human health in a serious condition by applying undesired materials into food stuff. These undesired additives purposefully mixed by the corrupt traders to maximize their profit decrease the food quality and cause serious health hazard.
- ✓ **Indiscriminate Use of Hormones in Vegetable:** Oxytocin is a hormone, released from the pituitary gland and act as neurotransmitter in brain. It is also known as 'love hormone' as it controls the social behavior in human. It is generally used to facilitate normal delivery and to enhance milk secretion (Bartz, J. A. et. al. 2010). It is also used for treatment for problems of adolescent to control social and emotional behavior. Recently farmers around the World even in India are applying oxytocin indiscriminately to boost the growth of fruits and vegetables like pumpkin, cucumber, brinjal, gourd etc. Eating these vegetables and fruits may cause nervous breakdown, sterility and neurotic complication in human (Assad,N. I., et al 2016). But why farmers are using oxytocin? Actually oxytocin is very much cheaper than fertilizer and oxytocin needs almost no time or very much less time than normal process of growth.
- ✓ **Use of Antibiotics in Poultry Farms to Promote Growth:** Wide spread use of antibiotics like Chloro-tetracycline, Procaine, Oxy-tetracycline, Tylosin etc. in the feed stock of poultry farms is another serious problem for existence of human society (Castanon,J. I. R. 2007). Antibiotics increase the growth rate and decreases morbidity/ mortality rate of poultry chicken. Repeated and improper uses of antibiotics can generate drug-resistant bacteria and resulting 'Super bugs'. Human can get infected easily by consuming meat from these animals with resistant bacteria and even meet the terrible fate of death (Phillips,I. et al 2004).
- ✓ **Genetically Modified Organism (GMO):** GMO, the Genetically Modified Organisms are one kind of food stuff, whose genetic materials have been altered using genetic engineering technique. Nowadays GMOs as fruits and vegetables are available in super markets have potential negative effects on the environment and human health. The modified or altered gene in the GMO can change gene code in human and mutate to unknown horrible result. Again multiple toxins and allergens generated as bi-products in the GMO affect seriously human health. Most of the health and environmental risks of GMO are ignored by different governments around the world and their superficial regulations and

safety assessments. Though some manufacturers had to use certain logos or bar code in these GMO based fruits and vegetables by the influence of environmentalists but people are ignorant about the knowledge. 5 digit codes starting with 8 mean GMO and otherwise non-GMO or organic product. Unrestricted use of GMO based fruits and vegetables diminish the biodiversity and sustainability of the ecosystem (Norris, M. -L. 2015).

3. Fatal Effects of Food Additives and Adulterants on Human Health and Hygiene:

All the additives must be of food grade and used under certain permitted value, otherwise food get adulterated. To colour food stuff with red colour, the permitted red colours are Carmoisine, Ponceau-4R and Erythrosine. The permitted level of application is 4mg for Carmoisine & Ponceau-4R and 0.1mg for Erythrosine per kg of body weight. The dishonest traders do not use permitted colour because permitted colours are very costly, rather they use Rhodamine-B in sweets like gulab jamun, halwas, hawai mithai, red coloured papads etc. which is an industrial colour. This Rhodamine-B in food damages spleen, liver, kidney and cause cancer. For green colour the permitted colour is Fast green and permitted level is 4mg per kg body weight. But Malachite green which is an industrial colour is widely used by different corrupt traders. The parvals, pees, green chilies in the market are often coloured by this harmful chemical. These chemicals are carcinogenic. The permitted yellow colour is Tartrazine and Sunset Yellow. But the Metanil yellow which popularly known as 'Kishori colour' and Lead Chromate are used widely in turmeric powder, mixed spices, various yellow sweets, mihidana, biryani, polao etc. The Metanil yellow cause cancer, stomach pain, ulcer. While Lead chromate can cause anemia, abortion, paralysis, brain damage etc (Table 1).

Table 1: Effects of Additives (Colouring agents) on Human Health

Colours	Permitted Colour	Permitted Level	Traders Use	Used in Commodities	Effect
Red	Carmoisine Ponceau-4R Erythrosine	4mg 4mg 0.1mg	Rhodamine-B	used in sweets like Gulab jamun, Halwas, Hawai mithai, Coloured papads etc	Damage Spleen, Liver, Kidney Causes Cancer
Green	Fast Green	4mg	Malachite Green	Used to colour Parwals, Peas, Green chilli, other green vegetables	Potentially carcinogenic Toxic to human cells
Yellow	Tartrazine, Sunset Yellow	7.5mg 2.5mg	Metanil Yellow or 'Kishori colour'	Used in Turmeric powder, various yellow sweets like Laddu, Dorbesh, Mihidana, Bonde, Amriti, Jalebi. Also used in Biryani, Polao,Beguni	Cancer Stomach pain Ulcer
			Lead Chromate	Used to colour Turmeric whole, Turmeric powder, Pulses, Mixed spices	Anemia Abortion Paralysis Brain damage

Some other food additives which can cause food adulteration are Aluminium foil, Mono-Sodium Glutamate, popularly known as 'Ajinamoto', Sodium benzoate, Sodium nitrite, Calcium carbide, Argemone oil, Formalin etc. Aluminium foil used in sweets, betel leaves instead of food grade Silver cause mental retardation, spongy bone etc. The Aginamoto used in the restaurants to enhance flavor of some prepared food can cause cancer. Starch from soyabean powder or even from old news prints used for producing paneer, rasagolla, milk khoya etc. can harm our normal gastro-intestine. Sodium benzoate used to preserve tomato ketchups cause allergies and asthma. In popular restaurants the prepared meat food stuffs are generally preserved using Sodium nitrate is a carcinogenic chemical. Fruits are artificially ripened by using Calcium carbide which can cause diarrhea, ulcer and even miscarriage (Dhembare, A. J. 2013). Argemone oil used in edible oils can cause gastro-intestinal problems. Not only these mentioned harmful additives or adulterants, but corrupt traders use much more than that and it is not possible to discuss here within limited pages (Table 2).

Table 2: Effects of other additives and adulterant on Human Health

Additives or Adulterant	Uses	Effect
Aluminium as thin foils	Used in Sweets and Betel leaves instead of food grade Silver	Mental retardation, Spongy bone Alzheimer's disease
Mono- Sodium Glutamate (MSG), Popularly known as 'Ajinamoto'	Enhance flavour in some prepared foods	Cause Cancer, Harmful for pregnant women, Hinders growth of the fetus in mother's womb
Starch from soybean powder or even newsprints	Paneer, rasagolla, milk khoya,	Gas in Stomach
Sodium Benzoate	Used to preserve Tomato	Allergies, Asthma

	Ketchups	
Sodium Nitrite (NaNO2)	Used in Restaurants to preserve meat	Causes Cancer
Calcium Carbide	Used to ripen fruits artificially	Diarrhea Ulcers, Miscarriages
Argemone oil	Edible oils	Gastrointestinal problems, Cardiac arrest

4. Methodology of Simple Homely Detection of Food Addultarants:

There are a lot of chemical and physical techniques to detect the harmful chemicals in our daily usable food stuff. Here some methodologies of simply homely detection of the harmful chemical food additives and adulterants have been identified as mentioned in the earlier sections. Application of Rhodamine-B in food stuff can easily be identified in our naked eye. Rhodamine-B is easily soluble in water, so food stuff with Rhodamine-B should be shaked with water and the solution should be placed before bright light. Light will be glittered from the Rhodamine-B solution in water, which clearly indicates the presence of Rhodamine-B. The presence of Malachite green in the food stuff can easily be identified at home by rubbing the food stuff contaminated with Malachite green with a piece of cotton soaked in liquid paraffin (coconut oil). If the piece of cotton turns green in colour then the presence of Malachite green is confirmed. After addition of Muriatic acid, which is commonly used to clean toilet at home, to a food stuff contaminated with Metanil yellow, the instant transformation to violet colour indicates the presence of the harmful chemical Metanil yellow (Wood, R.2004). When to a food stuff contaminated with Lead chromate, Muriatic acid is added, the instant pink colouration confirms the presence of Lead chromate (Table 3).

Table 3: Simple Homely Detection of Harmful Colouring Agents

Name of the Colouring Agents	Simple Experimental Procedures	Observations
Rhodamine-B	Sample solution in water placed against bright light.	Light is glittered from the solution.
Malachite green	Rubbing of a cotton piece soaked in liquid paraffin on the outer green surface.	Cotton piece turns green
Metanil yellow	Add few drops of Muriatic acid to sample.	Instant appearance of violet color
Lead chromate	Add few drops of Muriatic acid to sample	Pink colouration

Some other additives and adulterants which are used as preservatives, flavouring agents in the food stuffs can also be detected by simple chemical or physical techniques at our home. Al-foil can be distinguished from pure Silver leaves by burning Al-foils in flame which will be reduced to grey ash while Pure Silver leaves burn away completely. It is difficult to identify Ajinamoto i.e. Monosodium glutamate at home. But still it can be detected, if Monosodium glutamate solution is heated with reducing sugar at 145^{o}C, the brown colouration clearly indicates its presence. To identify Sodium benzoate, shake food stuff mixed with Sodium benzoate as preservative with dilute Hydrochloric acid i.e. Muriatic acid and to the decanted solution, few drops of Ferric Chloride solution have to add. If Sodium benzoate is present in the food stuff then light yellow-red precipitate forms. When milk based sweet food stuff contains Starch from soybean powder or even newsprints, then few drops of Iodine addition turns the food to blue colour (FSSAI, 2012). Calcium carbide cannot be easily identified in the artificially ripen fruits as the active reagent here is the acetylene gas, but artificially ripen fruits can be distinguished from the normally ripen fruits by observing their colour--the artificially ripen fruits have homogeneous colour while normally ripen fruits are not. Argemone oil can also be detected, when Ferric chloride solution is added to the food stuff containing Argemone oil in dilute Hydrochloric acid, needle shaped brown crystals will appear (Table 4).

Table 4: Simple Homely Detection of Harmful other Additives or Adulterants

Additives or Adulterants	Simple Experimental Procedures	Observations
Aluminium as thin foils	Burning of the sample in flame	On burning Al-foils reduced to grey ash while Pure Silver leaves burn away completely
Mono- Sodium Glutamate (MSG), Popularly known as 'Ajinamoto'	Sample solution in water heated with reducing sugar at 145^{o}C	brown colouration
Starch from soybean powder or even newsprints	Addition of iodine to sample	Blue colouration
Sodium Benzoate	Addition of Ferric Chloride solution to the sample solution in dilute HCl	Light yellow-red precipitate
Sodium Nitrite ($NaNO_2$)	Addition of Iodine to acidic solution of Sodium Nitrite	Brown colouration
Calcium Carbide	Simple observation	The artificially ripen fruits have

		homogeneous colour while normally ripen fruits are not
Argemone oil	Addition of Ferric Chloride solution to the sample solution in dilute HCl	Needle shaped brown crystals

4. Designing Purposive Learning Scheme:

Designing Purposive Learning Scheme for building awareness against harmful food additives and adulterants is a great challenge. The social environmental problems related to human health and hygiene arising from use of harmful food additives and other adulterants, hormones and antibiotics for growth boosting in vegetable and poultry farm animals respectively and GMO are the stimulus of the targeted purposive learning. The goal which is the main cause of purposive learning is the awareness building against the hazardous effects of these harmful chemicals as a preventive measure. This goal finally induce us to (effect according to Tolman) to develop a configuration of purposive learning (Figure 3) which includes

- ✓ **Conscious purposing**: Make our mind to sustain hygiene
- ✓ **Planning:** Compulsory extra-curricular activity, awareness building programme, campaign, rally, art film etc with central theme, the hazardous effects of the harmful food additives and adulterants used by different traders and manufacturers.
- ✓ **Executing:** The responsibility of implementation and executing comply on the different stake holders of the teaching communities and
- ✓ **Judging:** The target people of the society judge the necessity to learn and consciously learn.

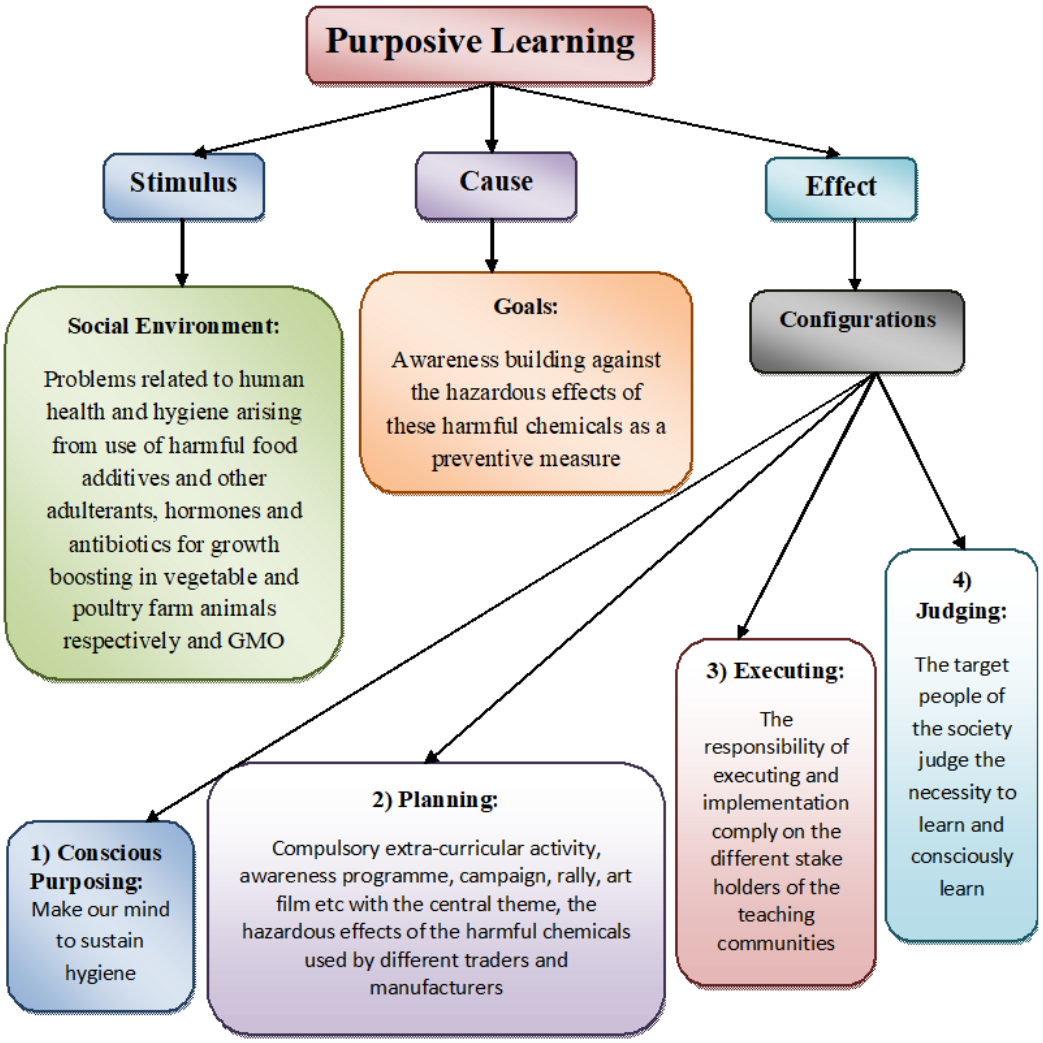

Figure 3: Purposive Learning Scheme

5. Conclusion:

There are a lot of acts around the Globe to punish the corrupt traders and manufacturers like 'Food Adulteration Act 1950', 'Food safety and standard Act 2006' etc. but the problem is not over after punishing them. To unravel this crisis, awareness building to sustain normal human health and hygiene is essential through purposive learning. This method for prevention by awareness building will not be successful, if traders and

manufacturers are not targeted in addition to common people in the awareness building programme through purposive learning.

For successful awareness building programme in the society, the readiness of different communities of the society is required. For this reason the awareness building programme through purposive learning had to include in the compulsory extra-curricular activities from the very early stage of childhood in addition to mass media practices. And then only the awareness against harmful chemicals in food stuff through purposive learning can be spread and prominent loud voice can be raised against the fact for 'To make in India for generation Y'.

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