The Impact of Food Production on Public Health: Systemic Strategies for a Diffused and Transversal Prevention Plan

A. Savina, M. Vrenna, P. Menzardi, P. P. Peruccio
Politecnico di Torino, Italy

RSD7 - Relating Systems Thinking And Design 7

Turin
October 24-26, 2018
INDUSTRIAL AGRI-FOOD PRODUCTION

The real costs of our daily food
INDUSTRIAL
AGRI-FOOD PRODUCTION

ECONOMIC COSTS

ENVIRONMENTAL COSTS

SOCIAL COSTS
INDUSTRIAL AGRI-FOOD PRODUCTION

ECONOMIC COSTS

ENVIRONMENTAL COSTS

SOCIAL COSTS

Already widely investigated not just in the Design Sector.
INDUSTRIAL 
AGRI-FOOD PRODUCTION

Social Costs

Analyzed with superficiality, especially if we consider...
INDUSTRIAL AGRI-FOOD PRODUCTION

SOCIAL COSTS

Analyzed with superficiality, especially if we consider...

HEALTH COSTS
Burdensome and prolonged over time for most individuals.

HEALTH RISKS
- Cancer
- Diabetes and Obesity
- Neurodegenerative Diseases
- Genetic Repercussions
- Fetal Taratogenesis
- Reproductive Malfunctions
COMMON MISCONCEPTION:
Division of two extremely connected concepts

QUALITY of the Food Production Process

Individual STATE OF HEALTH

INSUFFICIENT AND FRAGMENTED INFORMATION LEVEL about the links between

CONTAMINANTS present in food

DISORDERS and CHRONIC DISEASES
REDUCED ABILITY TO CHOOSE BY CONSUMER

- REDUCED POSSIBILITY TO CHOOSE
  (Primary selection of foods made by organised large-scale distribution system).
IT IS WORTH MAKING A COMPARISON...

SMOKING is a BAD HABIT.

Getting sick for it is a CHOICE.

FOOD is a NECESSITY.

NOBODY SHOULD GET SICK FOR IT.
Why has current food become so dangerous to our health?
STAGES OF THE LINEAR FOOD PRODUCTION PROCESS

AGRICULTURAL PRODUCTION

FEED PROCESSING

BREEDING

FOOD EXTRACTION

FOOD PROCESSING

FOOD PRODUCT CONSERVATION

SALE

SYSTEMIC DESIGN
Tool for reading and analysing linear agri-food supply chains
PHASES OF ADMINISTRATION OF CHEMICAL TOXIC POLLUTANTS
INSIDE THE AGRI-FOOD PRODUCTION CHAIN

Antibiotics
Growth hormones
Food supplements
Herbicides
Pesticides
Fertilizers
...

Sweeteners
Taste extenders
Thickeners
Gellifiers
Emulsifiers
Acidifiers
...

VOLUNTARY INPUT
Stabilizers
Preservatives
Antioxidants
...

INVOLUNTARY INPUT
Substances issued from predominantly polymeric packaging
(Bisphenol A, Phthalates, ...)

PRODUCTIVITY GROWTH

FOOD PROCESSING

CONSERVATION

CHRONIC CHEMICAL EXPOSURE
THE CONCEPT OF
“CHEMICAL BODY BURDEN”

Antibiotics
Growth hormones
Food supplements
Herbicides
Pesticides
Fertilizers
...

Sweeteners
Taste extenders
Thickeners
Gellifiers
Emulsifiers
Acidifiers
...

VOLUNTARY INPUT
Stabilizers
Preservatives
Antioxidants
...

IN VOLUNTARY INPUT
Substances issued from predominantly polymeric packaging
(Bisphenol A, Phthalates, ...)

DAILY MEAL
THE CONCEPT OF
“CHEMICAL BODY BURDEN”

mg/Kg

**ADI** - ACCEPTABLE DAILY INTAKE
Legitimated quantity of pollutant to be ingested daily without apparent impact on the body.

THE CONCEPT OF “CHEMICAL BODY BURDEN”

ADI - ACCEPTABLE DAILY INTAKE
Legitimated quantity of pollutant to be ingested daily without apparent impact on the body.

THE CONCEPT OF “CHEMICAL BODY BURDEN”

ADI - ACCEPTABLE DAILY INTAKE
Legitimated quantity of pollutant to be ingested daily without apparent impact on the body.

THE CONCEPT OF “CHEMICAL BODY BURDEN”

The effects come into synergy and multiply themselves. The result is larger than the sum of the effects of the individual pollutants.

**ADI** - ACCEPTABLE DAILY INTAKE
Legitimated quantity of pollutant to be ingested daily without apparent impact on the body.

<table>
<thead>
<tr>
<th>mg/Kg</th>
<th>mg/Kg</th>
<th>mg/Kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADI</td>
<td>ADI</td>
<td>ADI</td>
</tr>
<tr>
<td>a</td>
<td>b</td>
<td>c</td>
</tr>
</tbody>
</table>

This is the responsible of an “epidemic” that can also disrupt the health of future generations.

World Health Organization (WHO)
DISEASES AND DISORDERS RELATED TO INDUSTRIAL FOOD PRODUCTION

- Cancer
- Diabetes and obesity
- Neurodegenerative diseases
- Cardiovascular diseases
- Behavioral disorders
- Fetal taratogenesis
- Reproductive malfunctions
GROWTH OF TRANSGENERATIONAL EFFECTS

Cocktails of pollutants inside the umbilical cords
Permeability of the placenta
SUSTAINABLE DEVELOPMENT IN THE HEALTH SECTOR: A CHANGE OF PARADIGM IN THE MANAGEMENT OF CURRENT PUBLIC HEALTH

From health prevention of the current population...

...to the defense of the health of future generations

On the basis of that assumption, SYSTEMIC DESIGN CAN LEAD TO BEHAVIORAL CHANGE
How?
Through the creation of a network of relationships between local actors involved in the prevention process.
How?

Through the creation of a **network of relationships between local actors** involved in the prevention process.
How?
Through the creation of a network of relationships between local actors involved in the prevention process.

Systemic Designer
Interdisciplinary professional figure

People
- Mothers
- Families
- Individuals suffering from chronic diseases

Healthcare facilities (public and private)

Agri-food Companies
How?
Through the creation of a network of relationships between local actors involved in the prevention process.
Medical Specialist
Guidance / Interaction / Collaboration

“Prevention rather than treatment”
Medical Specialist
Guidance / Interaction / Collaboration

“Prevention rather than treatment”

3 Starting Points

- Consideration of the link between diseases | nutrition | food production.

- Evaluation of the individual’s eating habits.

- Identification of the human body as an interconnected system.
Consideration of the link between diseases | nutrition | food production.

- Evaluation of the individual’s eating habits.

- Identification of the human body as an interconnected system.

Guidance to:

- Conscious purchase and a genuine tasty food preparation.

- Knowledge of food properties.

- Resize and prevent disorders and diseases through food.
Food Producer
Production Monitoring from seed to sale.

“Clean food without pollutants”
**Food Producer**

*Production Monitoring from seed to sale.*

*“Clean food without pollutants”*

---

### 3 Starting Points

- **Production without chemical inputs**, which follows the **seasonality** of the products.

- **Adoption** of **recognized labels** and **certifications** that guide, orient and reassure consumers.

- **Distribution on a small scale** and for pre-established periods to avoid the use of preservatives.
Food Producer

*Production Monitoring from seed to sale.*

“*Clean food without pollutants*”

3 Starting Points

- **Production without chemical inputs**, which follows the *seasonality* of the products.

- **Adoption of recognized labels** and **certifications** that guide, orient and reassure consumers.

- **Distribution on a small scale** and for pre-established periods to avoid the use of preservatives.

Enhancement of the production

- Rediscovery and enhancement of **varieties with high nutritive power**.

- Preference to the cultivation of **local varieties**.

- Indication of products suitable for certain **recipes**.
People
Awareness / Involvement / Interaction

“Good health through good food”
People

Awareness / Involvement / Interaction

“Good health through good food”

Knowledge

- Information on the adverse effects of highly processed food and chemical contaminants used during production.

- Recognition and correct perception of food risk.

- Conscious purchase guide through the ability to read and recognize labels and certifications.
People

Awareness / Involvement / Interaction

“Good health through good food”

Knowledge

- Information on the adverse effects of highly processed food and chemical contaminants used during production.

- Recognition and correct perception of food risk

- Conscious purchase guide through the ability to read and recognize labels and certifications.

Application and participation

- Workshops, cooking and self-production courses in health facilities, farms, city districts.

- Incline towards simple, little processed, organic foods.

- Willingness to pay a higher price for healthier food.
Examples of existing categories
CATEGORY 1
Finding local food products and meeting direct producers.

An example:

L’alveare che dice si!
Mangiar bene, mangiar giusto.

- Recovery of local and artisanal products.
- Direct comparison with food producers.
- Purchasing online, through app or website.

Users
Who want to put aside the product of large retailers, seeking the link with the territory and a quality product.

CATEGORY 2
Guidance to a conscious choice of food.

An example:

NaturMia
Il cibo come natura insegna

- Categorization of food products by season.
- Descriptive sheets about nutritional values, composition, ingredients, etc.
- Advice for the preparation of seasonal recipes

Users
Who wants to improve their purchasing choices for a healthier and more sustainable diet.
CATEGORY 3

Interaction between patients, medical figures, food-producers and chefs for the prevention of the diseases.

An example:

- Direct comparison between the project actors.
- Use of food products characterized by high properties and benefits.
- Seasonal and organic products recovered from local farms.
- Food education of the patient, through his involvement in the production process of the daily meal.
- Generating a higher level of awareness.

The “Diana 5 Project” and the healthy cooking courses with the cancer patients

Dr. Franco Berrino
Fondazione IRCCS “Istituto Nazionale dei Tumori” (INT)

Users
Cancer patients or individuals with chronic diseases who want to reduce their problems and prevent their deterioration.
NEED FOR A DOUBLE REVOLUTION

In the production of Daily Food

In the management of Public Health
NEED FOR A DOUBLE REVOLUTION

In the production of Daily Food

In the management of Public Health

Re-Design of the overall system

Health
Consideration of the chemical exposures suffered through food. Systemic prevention starts from changing food and its production.

Food
Prevention tool, not the cause of a growing disease system.

Knowledge/Awareness taking
Instrument of power, self-protection.
Thank you for attention
REFERENCES


