

Giornate Catanesi di Nutrizione Clinica - VI

COLLABORATIVE
PROBLE SOLVING
IN NUTRIZIONE CLINICA
Catania, 23-24 Giugno 2022

Energia del cibo e salute: un binomio inscindibile

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Coordinatore CIRS (Comitato Interdisciplinare Rifiuti e Salute)
Componente Task-Force Salute e Ambiente Ministero della Salute

TAVOLA SINOTTICA

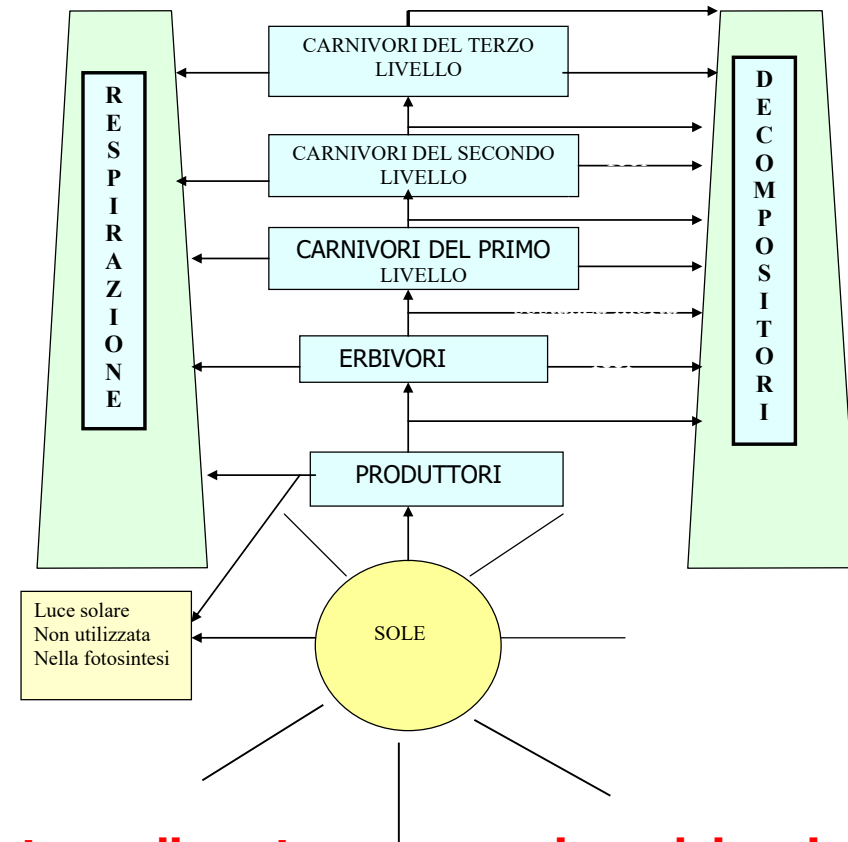
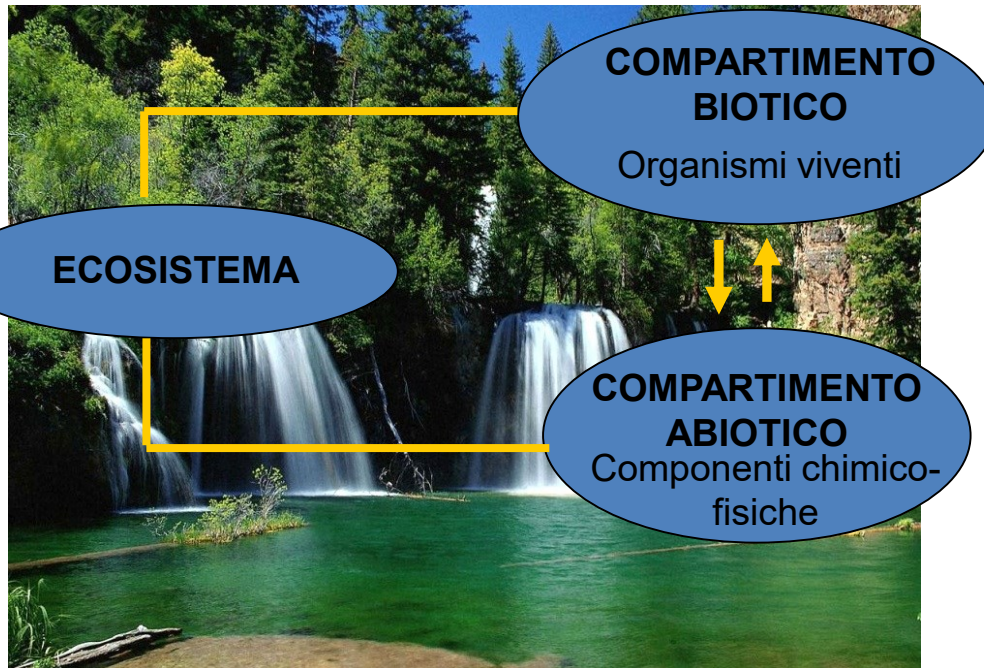
- **Alimenti ambiente organismi viventi**
- **Catena alimentare**
- **Contaminazione catena alimentare**
- **Cambiamenti climatici e guerre**
- **Principali contaminanti e salute**
- **Effetti della dieta sulla salute**
- **Considerazioni e Conclusioni**

S.it.l.

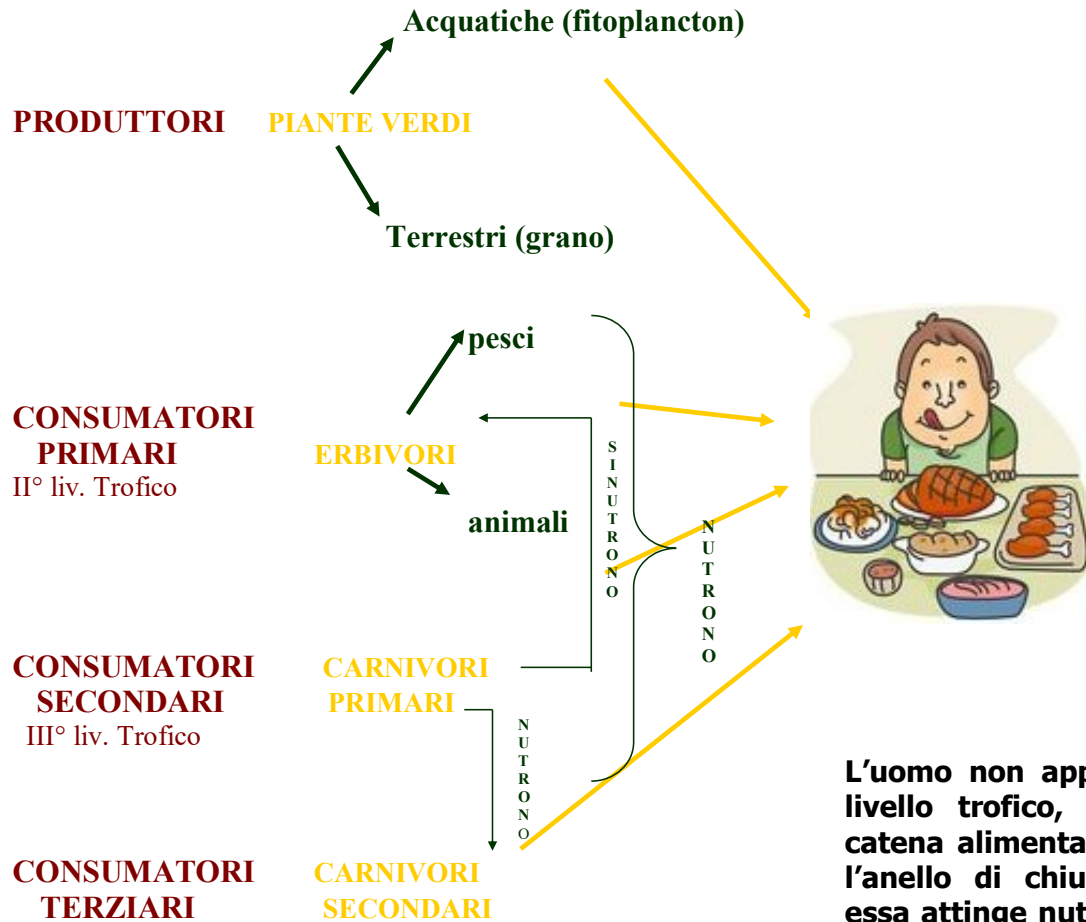
↳ **AMBIENTE** = L'insieme delle condizioni fisico-chimiche e biologiche che permettono e favoriscono la vita degli esseri viventi....

↳ **ALIMENTO** = Sostanza che, introdotta nell'organismo vivente, sopperisce al dispendio di energie e fornisce materiali indispensabili alla reintegrazione, all'eventuale accrescimento e allo svolgimento di funzioni fondamentali per la vita dell'individuo e della specie.....

Il rapporto tra l'ambiente e gli alimenti si è instaurato ancor prima della comparsa dell'uomo sulla terra, in seguito alla organizzazione dei fattori abiotici (luce, acqua, aria, nutrienti) e biotici (forme di vita varie) in biomi, ecosistemi, comunità ecologiche, caratterizzati ciascuno da vari livelli trofici .



Alla base dell'esistenza vi è la catena alimentare: successione dei vari livelli trofici attraverso cui avviene il trasferimento di energia e di massa



L'uomo non appartenendo ad alcun livello trofico, non fa parte della catena alimentare ma ne costituisce l'anello di chiusura, in quanto da essa attinge nutrienti ed energia per il proprio sostentamento. Questo da una parte garantisce la specie umana dall'estinzione, poiché l'uomo attinge il suo nutrimento da ogni trofismo ambientale, dall'altra lo rende più vulnerabile alla contaminazione

L'uomo ha ricercato, in maniera crescente e proporzionata alle proprie conoscenze, le migliori condizioni per alimentarsi. Si è procacciato gli alimenti con metodi inizialmente compatibili con la dinamica dei processi naturali :

agricoltura



pesca



pastorizia



caccia





Ha inventato la cottura per rendere il cibo più digeribile e appetibile e la salagione, l'essiccamento, l'affumicamento per conservarlo.



L'uomo, nel ricercare le migliori condizioni di benessere, si è cimentato in avventure tecnologiche sempre più sofisticate. Tali attività hanno introdotto nell'ambiente miriadi di elementi, spesso sconosciuti, non compatibili con la vita, di provenienza fisica, chimica e biologica.



Lo sviluppo tecnologico ha sconvolto la dinamica ambientale rendendo innaturale il rapporto ambiente alimenti:

L'agricoltura da estensiva è divenuta intensiva



Xenobiotici,
Es. pesticidi,
metalli.....



La pastorizia è divenuta allevamento industriale



Mangimi (scarti animali, antibiotici, anabolizzanti...)





Mezzi chimici Es. Conservanti



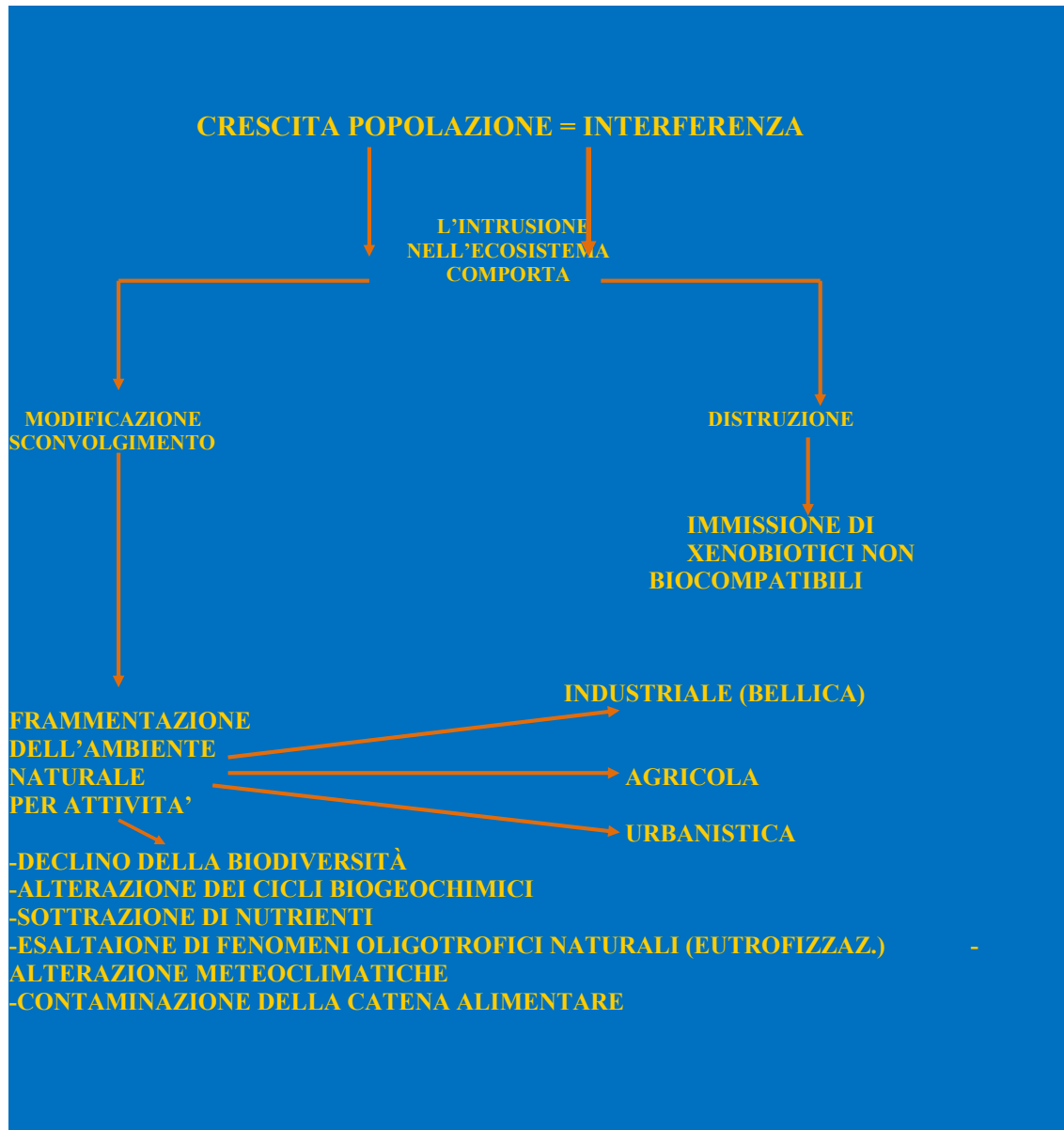
Mezzi Fisici Radiazioni Es. UV, Gamma; Calore Es. Sterilizzazione, Trattamento UHT

La conservazione degli alimenti viene effettuata con mezzi chimici e fisici



Freddo Es. Congelamento



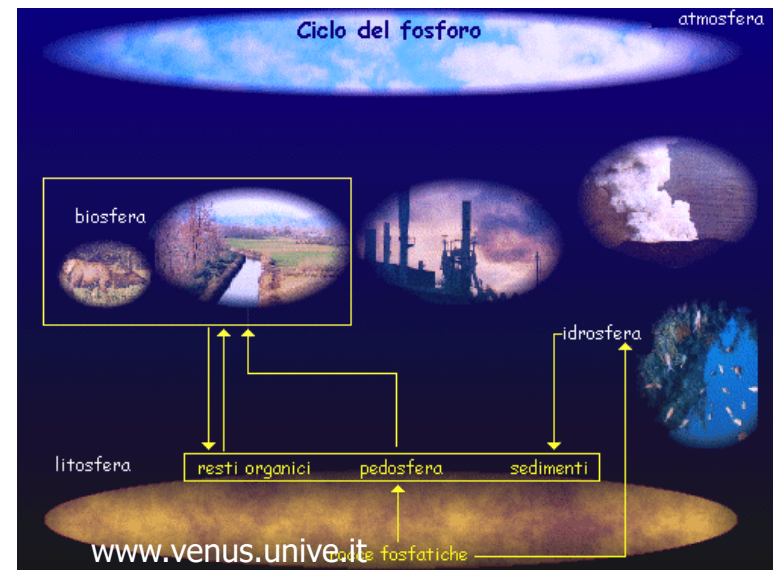
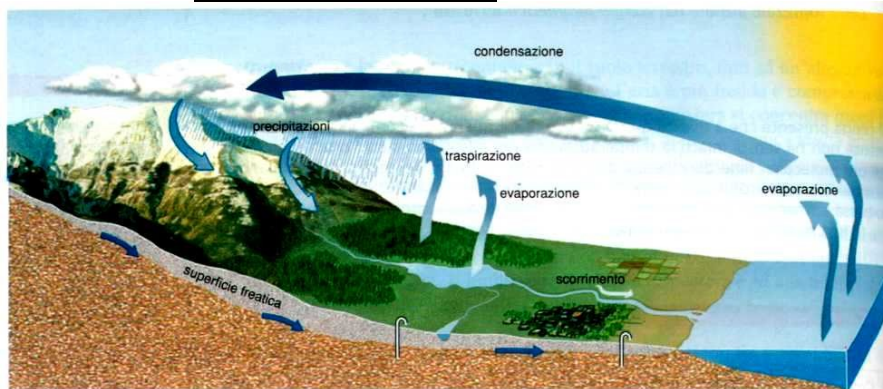


Il progresso della ricerca, sia empirica che scientifica, ha generato livelli ottimali di benessere, debellando le grandi epidemie e contrastando le gravi carestie;

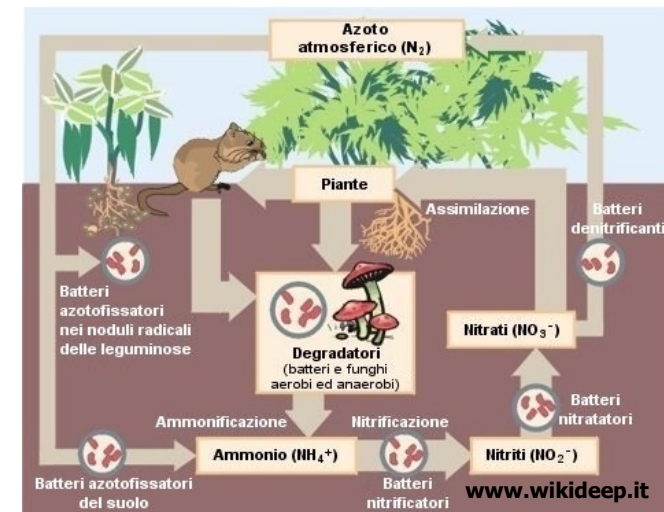
tuttavia il conseguente sviluppo tecnologico ha spesso sconvolto la dinamica ambientale con le varie attività da quella agricola a quella urbanistica, da quella industriale a quella bellica.

Alterazione dei cicli biogeochimici

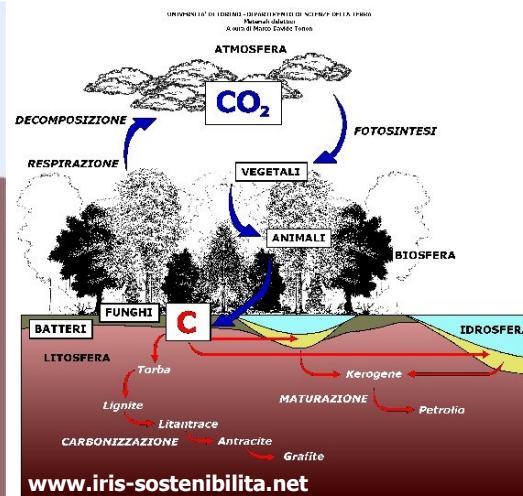
Ciclo acqua



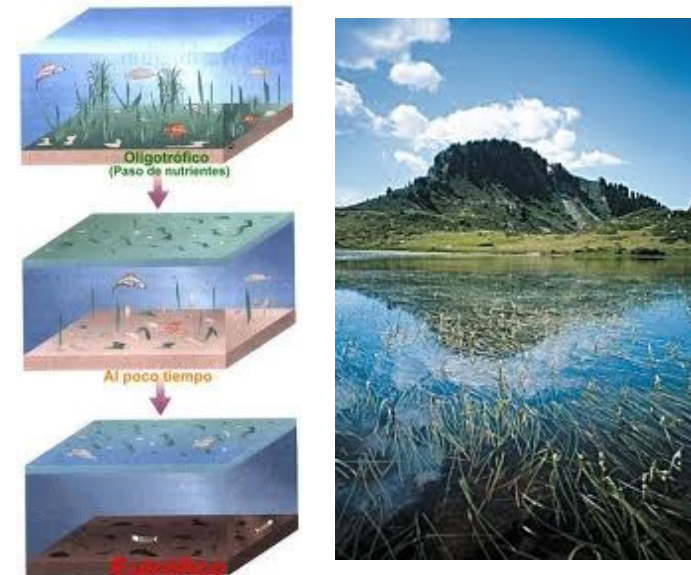
Ciclo dell'azoto



CICLO DEL CARBONIO



Esaltazione dei fenomeni oligotrofici



ALTERAZIONI METEO CLIMATICHE



NASA GLOBAL CLIMATE CHANGE
Vital Signs of the Planet

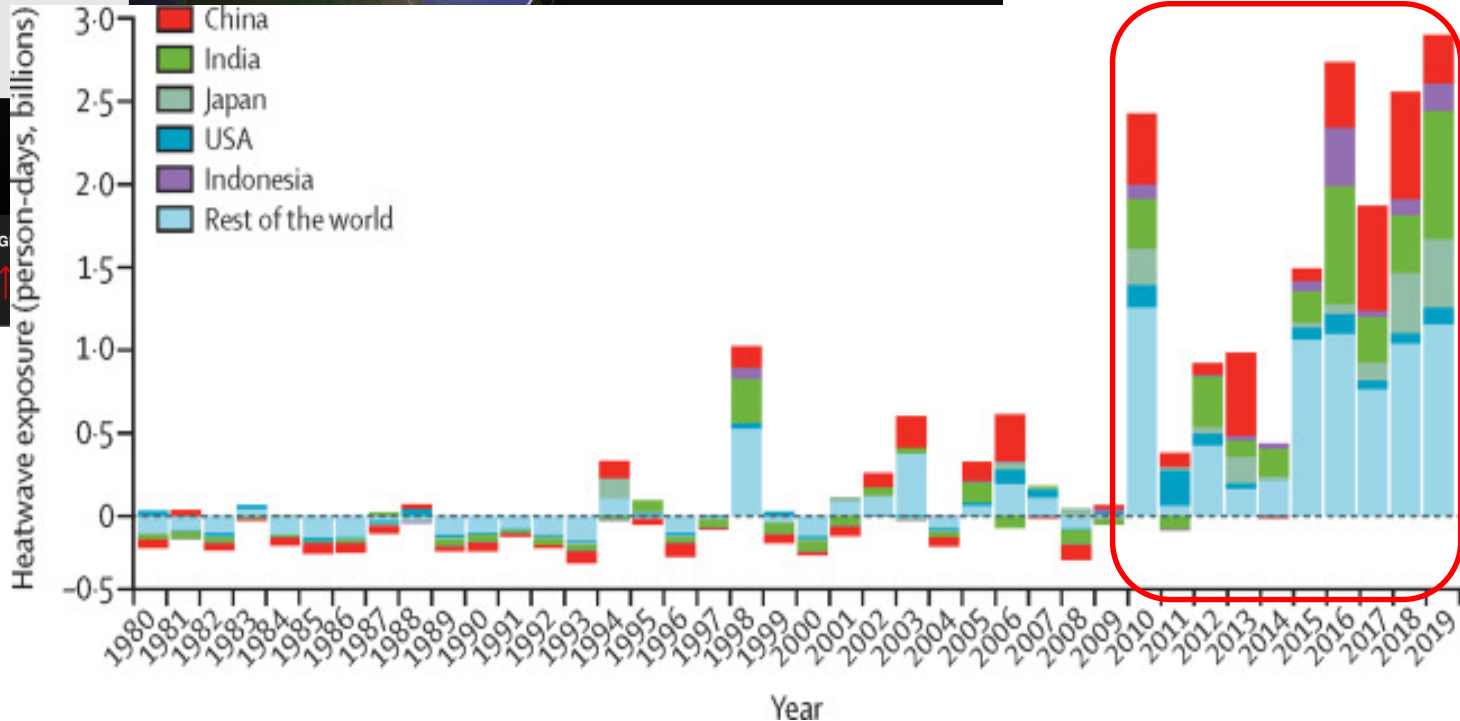
FACTS ARTICLES SOLUTIONS EXPLORE RE

INTERACTIVES

Eyes on the Earth

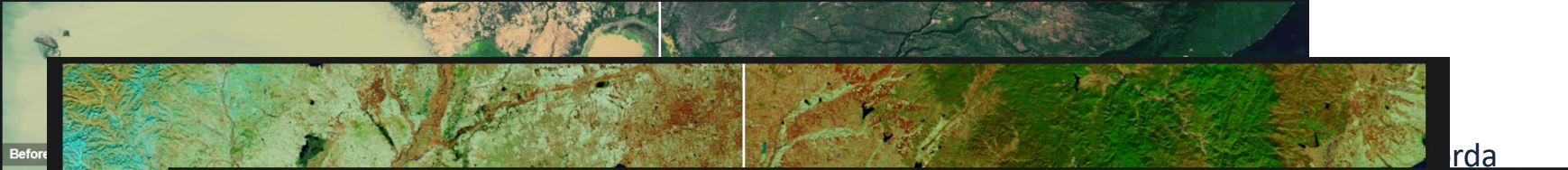
Fly along with NASA's Earth-orbiting satellites and view our planet's vital signs with this real-time data visualization.

ENTER



CARBON DIOXIDE

↑ 417 parts per million



Before

After

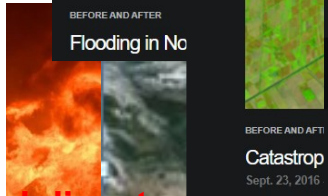


Before

Before

After

BEFORE AND AFTER
Two K



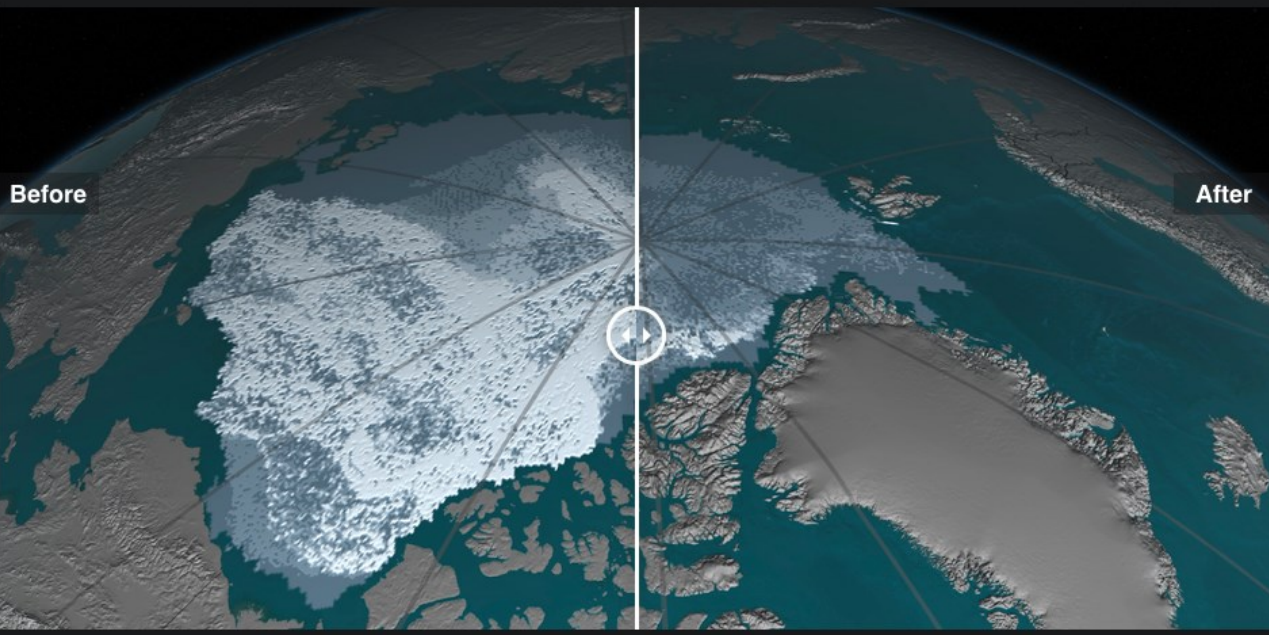
BEFORE AND AFTER
Flooding in No

BEFORE AND AFTER
Catastroph
Sept. 23, 2016

Natural disasters and variable rainfall patterns



Before



Before

After

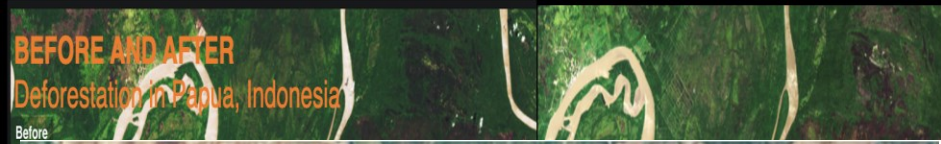
BEFORE AND AFTER
Persisten
Californi

BEFORE AND AFTER

Older, thicker Arctic sea ice declines

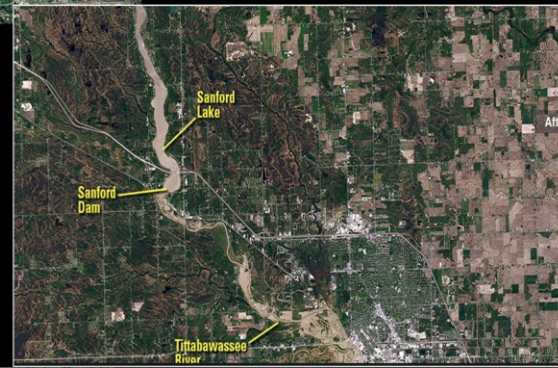
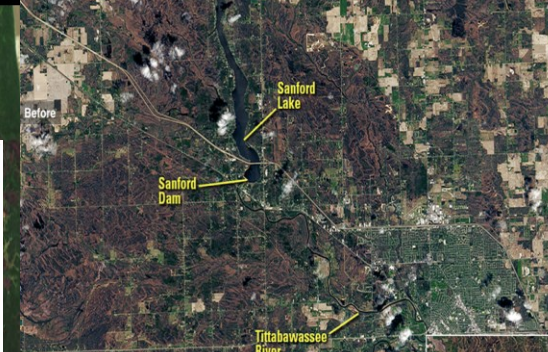
BEFORE AND AFTER Deforestation in Papua, Indonesia

Before



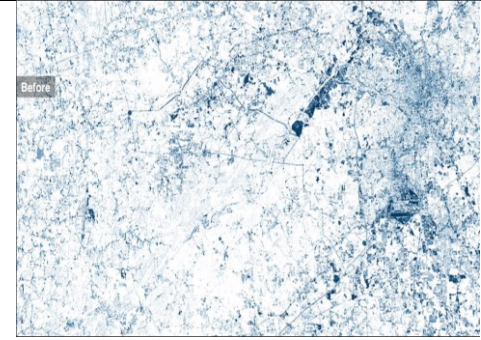
Solar Power Plant in Usagre, Spain, is Europe's Largest

Before



After

After



AFT
ER

The "Great Migration" north of the early 20th century, people from the Northeast and Midwest have been moving to Atlanta (Georgia, USA)



Oggi si leggono sconvolgimenti ambientali quali : **il declino della biodiversità**

diversità genetica



diversità delle specie



diversità degli ecosistemi



praterie

mangrovie

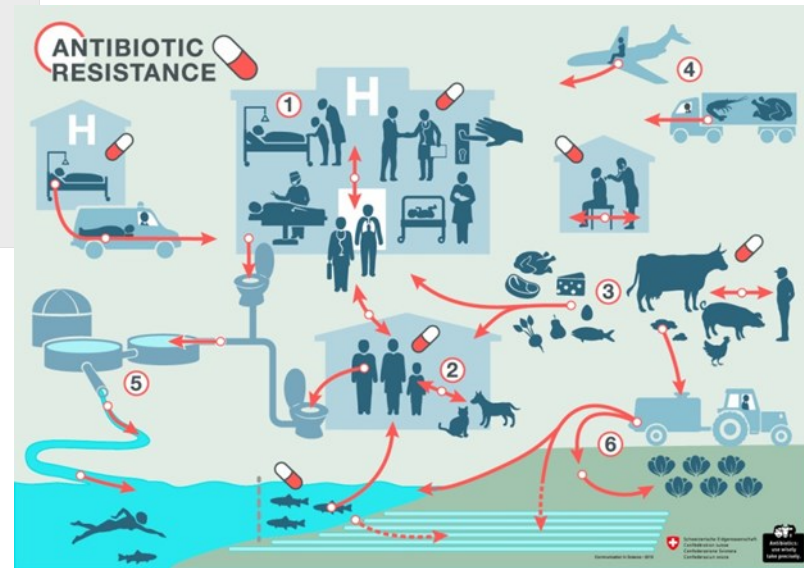
coralli

paludi

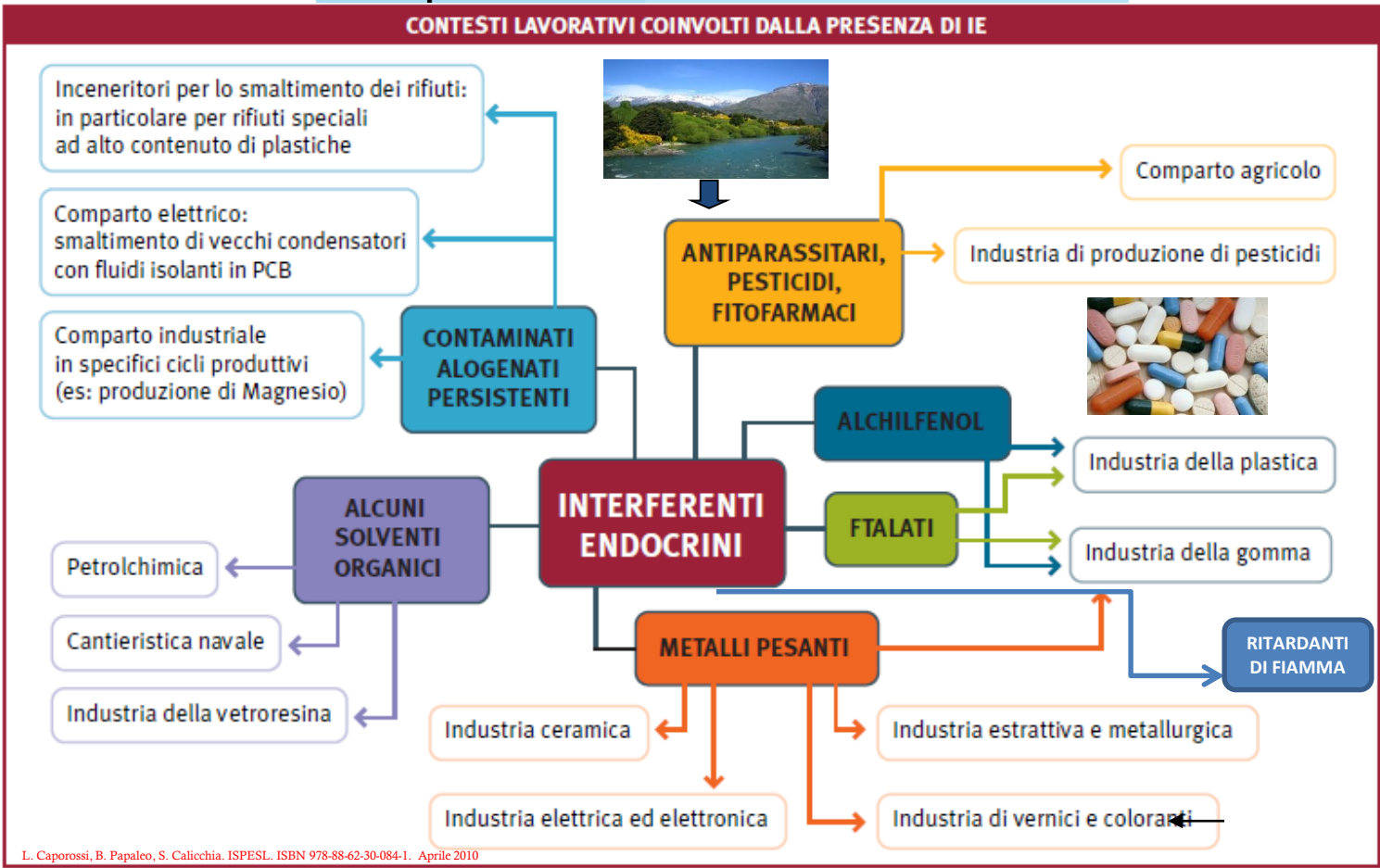
Foreste fluviali



Sottrazione di nutrienti



CONTAMINAZIONE DELLA CATENA ALIMENTARE



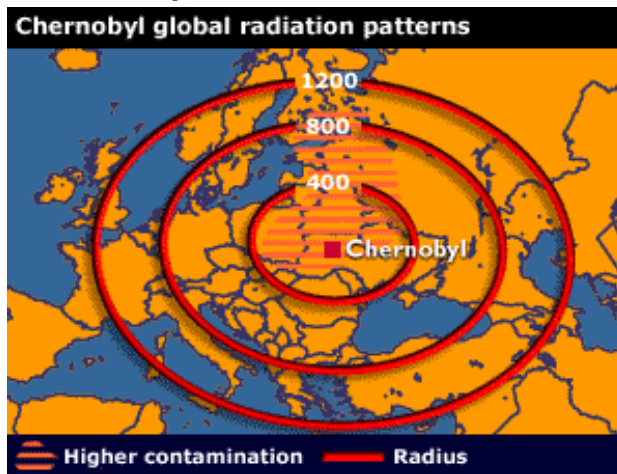
- Effetti tossici acuti e cronici
- Mutageni
- Cancerogeni
- Teratogeni



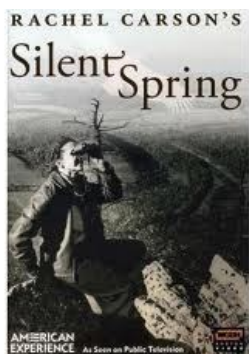
Maggiormente esposti sono i bambini che assumono sostanze tossiche in misura maggiore in quanto proporzionalmente alle caratteristiche staturali, si alimentano per un periodo maggiore degli adulti.

Tra gli esempi più significativi che evidenziano il nesso di causalità tra inquinamento ambientale, contaminazione alimentare e salute umana possiamo ricordare Hiroshima, Chernobyl (26 APRILE 1986).... Fukushima (11 MARZO 2011)

Gli incidenti di questo tipo causano un rilascio prolungato di sostanze radioattive, che si disperdono su lunghe distanze e interessano territori molto vasti tanto da potersi trasformare in catastrofi di dimensioni internazionali.



Sono passati oltre 36 anni dall'incidente ma i pericoli della radioattività non sono svaniti. In aree che allora risultarono interessate dalla contaminazione radioattiva la percezione del rischio sul Cesio 137 è ancora elevata, così come per Fukushima anche se le analisi effettuate da una task force istituita presso il Fukushima Agricultural Technology Center sono rassicuranti, la ripresa economica appare lontana.



Nei primi anni 60, Rachele Carson nel suo libro *Primavera silenziosa*

denuncia i danni ambientali e sanitari prodotti dall'uso in agricoltura dei pesticidi, soprattutto del **DDT**

1932-1968 – **Minimata**, uno sversamento costante di metilmercurio da un'industria chimica causò accumulo nei molluschi, nei crostacei e nei pesci, entrando nella catena alimentare e causando così avvelenamento da mercurio degli abitanti del luogo.



1961-1975 – **Vietnam**, vengono scaricate nell'ambiente e sulla popolazione vietnamita 80.000 t del potente erbicida, agente Arancio (diossina e arsenico) con effetti devastanti per la popolazione e l'ambiente.



1976-**Seveso**, esplose un reattore di un impianto chimico si verifica una pericolosa fuga di diossina. Moria degli animali, contaminazione di ortaggi, frutta, verdura e numerosi casi d'intossicazione.

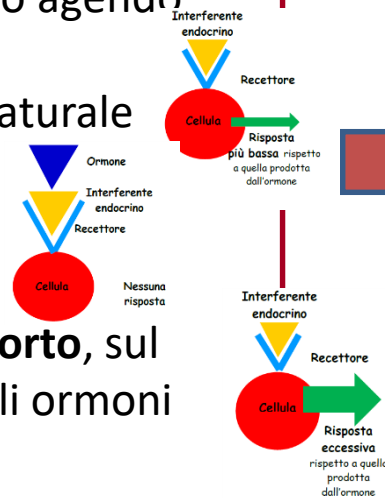


il DDT viene ancora utilizzato nei paesi del terzo mondo per combattere la malaria. La buona notizia è che l'uso globale del DDT per il controllo dei vettori di malattie è diminuito da 10 paesi che lo utilizzavano per la spruzzatura residua interna (IRS) nel 2010 a cinque paesi nel 2019.

PROBLEMATICHE EMERGENTI

Queste sostanze sembrano interferire sul funzionamento del sistema endocrino agendo almeno a tre livelli:

- simulando l'azione di un ormone naturale (**effetto agonistico**);
- bloccando i recettori ormonali (**effetto antagonistico**);
- interferendo sulla **sintesi**, sul **trasporto**, sul **metabolismo** e sull'**escrezione** degli ormoni naturali.



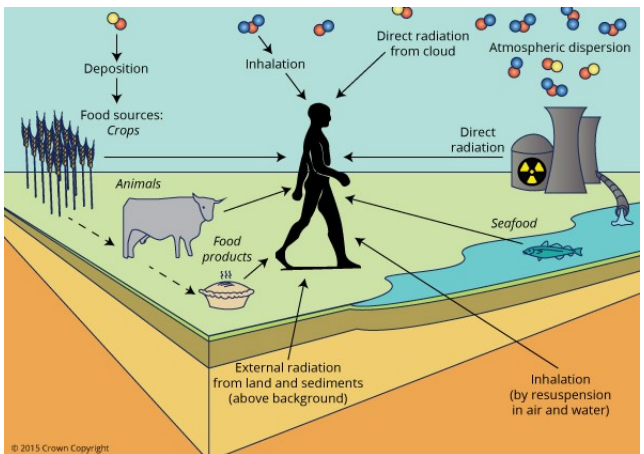
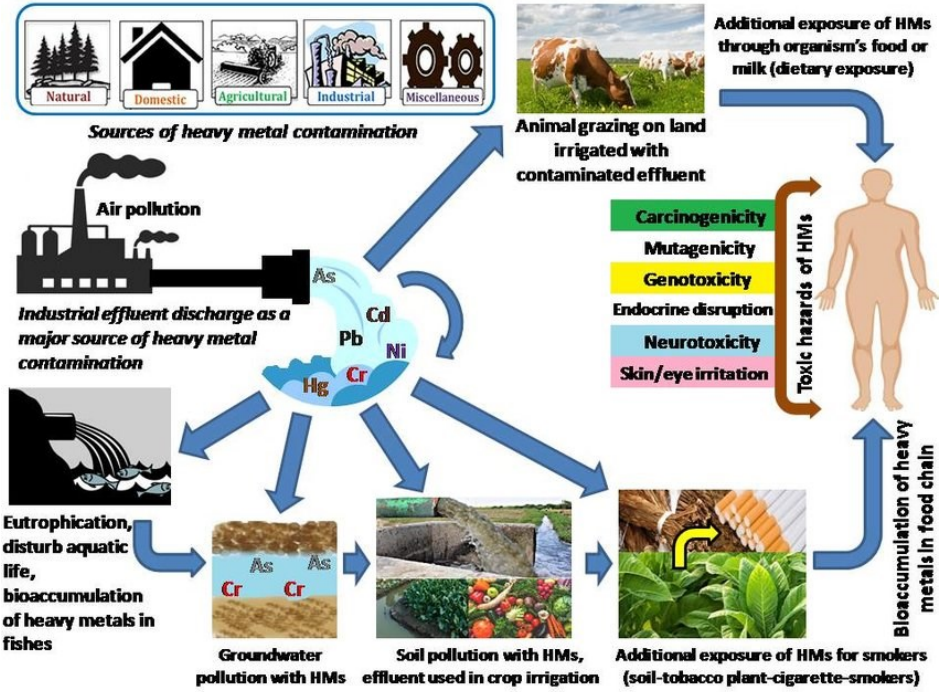
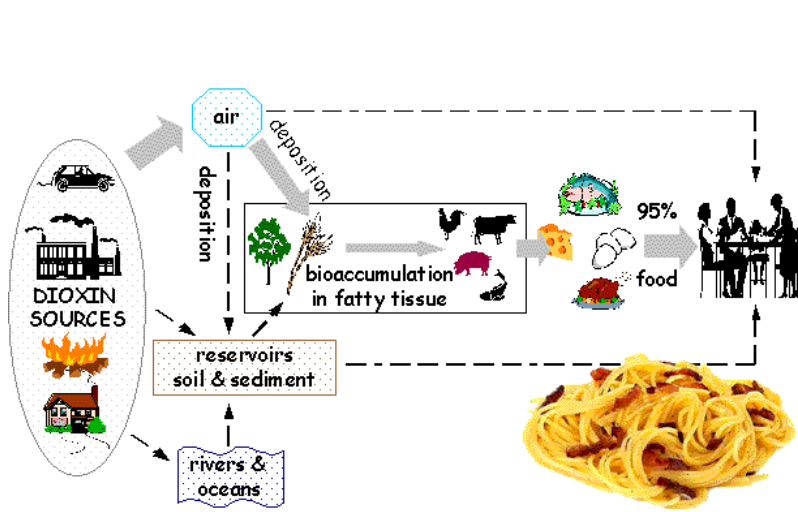
Interferiscono negativamente su:

- **differenziazione, sviluppo e maturazione fetale**
- **riproduzione**
- **comportamento sessuale**
- **funzione tiroidea.**

Il Parlamento Europeo, durante la seduta del 2 Luglio 2013, ha incluso i preparati ormonali 17alphaethinylestradiol e 17-beta-estradiolo e l'antidolorifico Diclofenac in una "watch list" di sostanze inquinanti "emergenti.

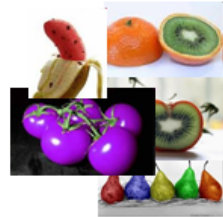
Dal gennaio 2023 il nonilfenolo e il beta-estradiolo si cercheranno obbligatoriamente fra le sostanze emergenti nelle acque potabili (decisione UE 679/2022 come da direttiva UE 2184/2020)

PROBLEMATICHE EMERGENTI

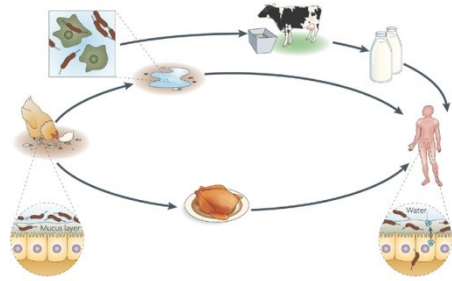


L'intromissione dell' uomo modificato l'assetto trofico con l'introduzione di nuove specie mediante tecniche di ingegneria genetica.

Organismi Geneticamente Modificati (OGM), ovvero individui di specie innaturali che, inserendosi nei livelli trofici, possono avere un impatto ambientale tale da alterare il delicato rapporto ambiente/alimenti.



INFEZIONI E TOSSINFEZIONI ALIMENTARI



Gli OGM sono utilizzati in agricoltura per migliorare le resistenze dei prodotti agricoli contro le sostanze chimiche, gli infestanti, le avversità climatiche, e per ritardare la maturazione dei prodotti agricoli consentendone un utilizzo programmato in qualsiasi luogo e periodo dell'anno.

PROBLEMATICHE EMERGENTI

Harmful Algal Blooms in the

Margherita Ferrante*, Salvatore Sciacca, Roberto Fal
Department G.F. Ingrassia, Hygiene and Public Health, Universit

Abstract

A harmful algal bloom (HABs) is defined as a massive increase in the population of marine algae. Marine algal toxins are responsible for exposure to aerosolized toxins. The impact on the environmental health effects of chronic exposure to these toxins are an emerging issue. Consumption of shellfish can lead to paralytic shellfish poisoning (PSP), diarrhetic shellfish poisoning (DSP), and ciguatera fish poisoning (CFP) in the Mediterranean Sea.

Keywords: Harmful algal bloom; Mediterranean shellfish poison; Ciguatera fish poisoning; Diarrhetic shellfish poisoning; Neurotoxic shellfish poisoning; Paralytic shellfish poisoning

Introduction

Algae are unicellular microscopic plants that are essential for life. An algal bloom develops in the marine or freshwater environment when there is an excess of growth of these organisms. Changes in that environment. A harmful algal bloom (HAB) is a bloom that has deleterious effects on plants, animals, and humans. Phytoplankton blooms, micro-algal blooms, red tides, or harmful algae, are all terms for these natural phenomena [3]. HABs can deplete the oxygen and block the food web that other organisms need to live, and some HABs release toxins that are dangerous to animals and humans. Marine algal toxins are responsible for an array of human illnesses associated with consumption and exposure to aerosolized toxins. On a worldwide basis, there are more than 60,000 intoxications reported each year, with an overall mortality rate of 1.5%. In addition to human health, algal toxins are responsible for extensive mortality in marine mammals, birds, and other animals dependent on the food web. The impacts of algal toxins are generally observed in acute intoxications, whereas the effects on health of chronic exposure to algal toxins are only poorly documented and a matter of ongoing research [4,5]. Algal toxins of dinoflagellates and diatoms harm humans. Filter-feeding shellfish, zooplankton, and herbivores are particularly vulnerable.

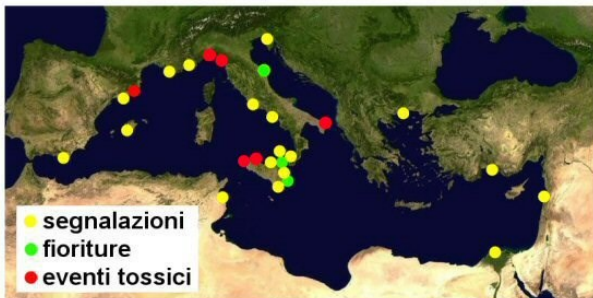


Table 2: The frustule of diatoms. As can be seen, the frustule is composed of silica, which can be associated with small amounts of aluminum, iron, and titanium.



Figure 7: Pseudo-nitzschia (Amnesic Shellfish Poisoning)

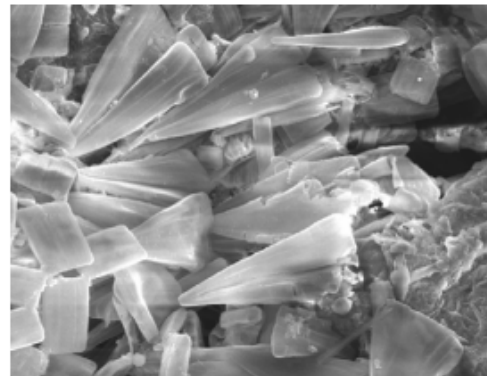
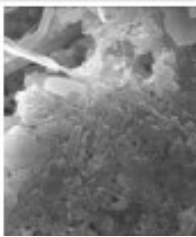


Figure 2: Sample of macroalgae rich in species of diatoms from Playa 2008.

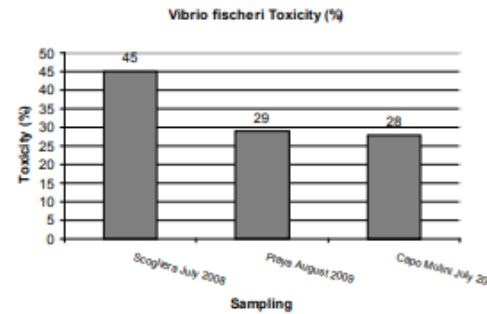


Figure 3: Positive samples tested for toxicity. All other locations sampled have shown no toxicity.

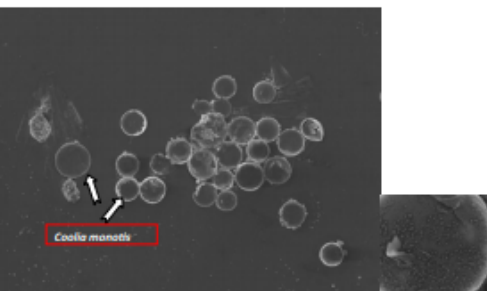


Figure 4: Specimens of Coela monotis and structure of its frustule (see zoom) related to cooliatoxin a neurotoxic analog to yessotoxin.

hydrated silica, which can be associated with small amounts of aluminum, iron, and titanium. As can be seen, the frustule is composed of silica, which can be associated with small amounts of aluminum, iron, and titanium.

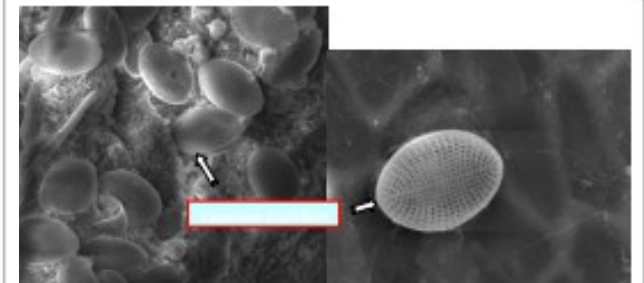


Figure 9: Cocconeis scutellum in macroalgae sampled in Acicastello 2009 and structure of its Frustule (see zoom), no toxicity reported.

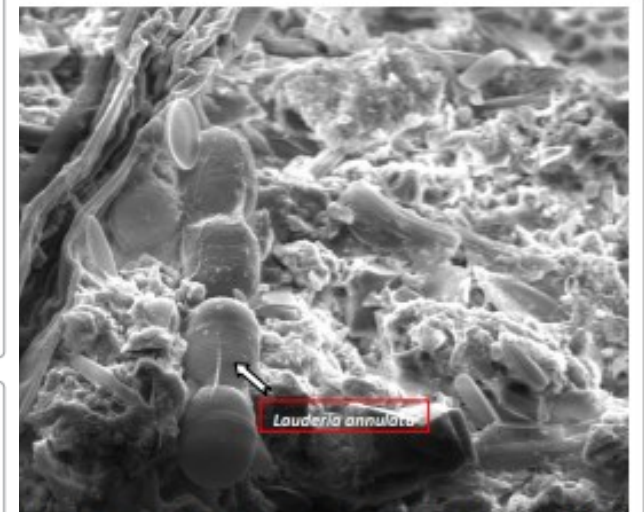
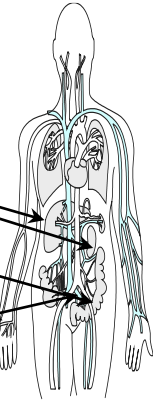


Figure 10: Lauderia annulata in macroalgae sampled in Acicastello 2010, no toxicity reported.

SEM recognition of phytoplankton species found was carried out according to the manual "Guide to the recognition of the plankton of the Italian seas" [18]. The number of phytoplankton cells was counted according to Utermöhl method [19].

Questioni emergenti: sicurezza alimentare

Micotossina	Bersaglio
Aflatossina	Fegato
Ocratossina A	Rene
Tricoteceni	Mucosa
Ergotina	Sistema vascolare periferico
Zearalene	Tratto uro-genitale



7

Carcinogen Role of Food by Mycotoxins and Knowledge Gap

Margherita Ferrante, Salvatore Sciacca and Gea Oliveri Conti
University of Catania, Department "G.F. Ingrassia" Hygiene and Public Health, Italy

1. Introduction

In today's world health and safety are among the basic human needs. Ensuring food safety has been a major focus of international and national action over the last decades.

Both, microbiological and chemical risks are of concern. The "World Health Organization" (WHO) has identified as significant sources of food-borne diseases contamination of food and feed by mycotoxins (toxic metabolites of molds) and the contamination of fishery products by phycotoxins (toxins produced by algae).

Despite public health and prevention managers have paid particular attention to mycotoxins, in several areas of the world they are still an important food safety issue (Fig. 1).

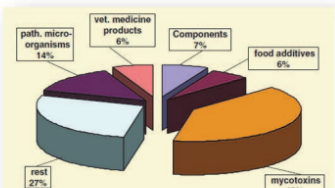


Fig. 1. Notifications for food and feed in 2005 (from EU rapid alert system, by European Commission 2006).

Mycotoxins can cause diseases in humans, crops and animals that have led many Countries to establish limits on mycotoxins in food and feed to safeguard people's health, as well as the economical interests of producers and traders.



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https://doi.org/10.1007/s11356-019-06089-9

RESEARCH ARTICLE

Efficacy of different citrus essential oils to inhibit the growth and B1 aflatoxin biosynthesis of *Aspergillus flavus*

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Abstract

Food contamination by aflatoxin B1 (AFB1), produced by mycotoxigenic strains of *Aspergillus* spp., causes severe medical and economic implications. Essential oils (EOs) are mixtures of eco-friendly natural volatile substances. Their ability to inhibit fungal growth has been investigated, while no data are available about their efficacy in inhibition of AFB1 biosynthesis. This study investigates the efficacy of five different citrus EOs to inhibit the growth and AFB1 synthesis of *A. flavus* through in vitro tests for a future application in food matrices. AFB1 detection was carried out by LC-ESI-TQD analytical approach. Lemon (*Citrus limon* (L.) Blume), Bergamot (*Citrus bergamia* Risso), and bitter orange (*Citrus aurantium* L.) EOs were the most effective causing a 97.8%, 97.04%, and 96.43% reduction in mycelial growth, respectively. Sweet orange and mandarin EOs showed the lowest percentage of mycelial growth reduction. Citrus EOs showed different capacity of AFB1 inhibition (lemon > bitter orange > bergamot > sweet orange > mandarin). Our results showed a dose-dependent antifungal activity of lemon, bitter orange, and bergamot EOs which at 2% (v/v) inhibited both mycelium growth and AFB1 genesis of *A. flavus*. Our results show that EOs' use can be a pivotal key to recovery and reuse of citrus fruit wastes and to be used as eco-friendly fungicides for improvement of food safety. The use of EOs obtained at low cost from the residues of citric industry presents an interesting option for improving the profitability of the agriculture.

Keywords Citrus · Essential oils · *Aspergillus flavus* · Growth inhibition · Aflatoxin B1 · Food contamination

Highlights

- The study provides first data about citrus EOs' efficacy in *Aspergillus* spp.
- This study is the first that evaluates five EOs efficacy in mycelium growth and AFB1 biosynthesis control.
- Lemon, bergamot, and bitter orange EOs were the most effective in mycelium growth reduction.
- Citrus EOs showed different capacity of AFB1 inhibition (lemon > bitter orange > bergamot > sweet orange > mandarin).
- Our results show that EOs' use can be used as eco-friendly fungicides for improvement of food safety.

Responsible editor: Philippe Garrigues.

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olivericonti@unict.it

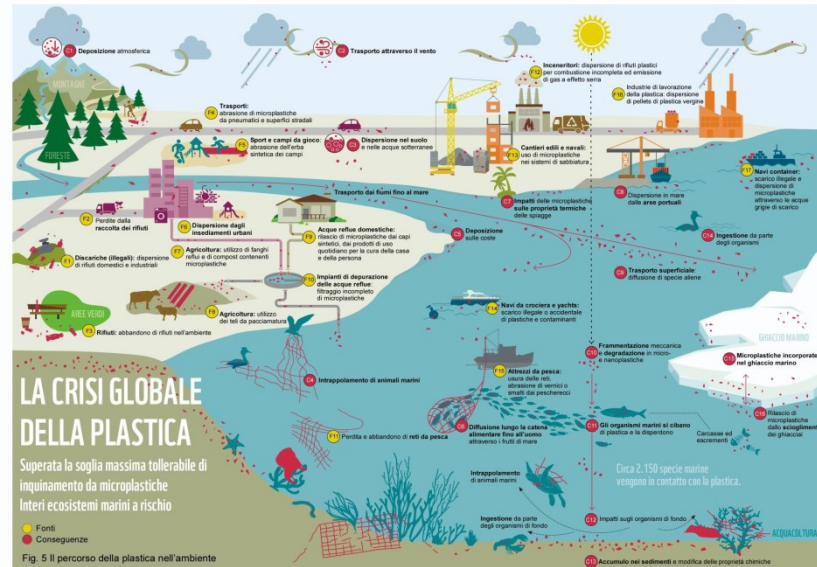
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² Environmental and Food Hygiene Laboratories (L3AA), Department of Medical, Surgical Sciences and Advanced Technologies "G.F. Ingrassia", University of Catania, via Santa Sofia 87, 95123 Catania, Italy

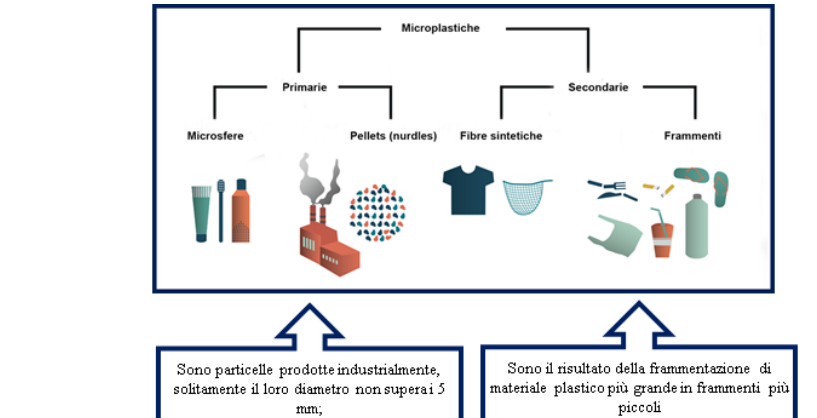
Introduction

Safe food enhances individual and population health. Challenges in food safety include chemical, biological, physical, and environmental risks (Fallahzadeh et al. 2018; Fung et al. 2016; Falher et al. 2018; Zucarella et al. 2019; Kenemati et al. 2018; Fore et al. 2019).

Several studies examined the antimicrobial effects of some oils to search for natural fungicides (Mojibaj et al. 2018). The presence and growth of fungi in food may cause spoilage and resulting in a reduction in quality and quantity, besides causing severe medical and economic implications, especially for exporting countries. Some *Aspergillus* species, such as *Aspergillus flavus* and *Aspergillus parasiticus*, are able to produce aflatoxins (AFB1, AFB2, AFG1, AFG2) (Egbata et al. 2017; Kumar et al. 2017). However, only aflatoxin B1 (AFB1) is considered a carcinogen by the International Agency for Research on Cancer (IARC) having produced sufficient evidence of liver carcinogenicity in experimental animals. In fact IARC (2012) report that transgenic mice exposed to AFB1 showed liver carcinomas (rats showed hepatocellular



Superata la soglia massima tollerabile di inquinamento da microplastiche Interi ecosistemi marini a rischio



Questioni emergenti: sicurezza alimentare



DE TULLIO & PARTNERS
INTELLECTUAL
PROPERTY
ATTORNEYS

Roma, 10 Dicembre 2018

ns. rif.: AEDT 13584

Vs. rif.: Domanda di Brevetto Italiano per In

**Oggetto: Rapporto di ricerca ed opinio
Brevetto per Invenzione n. 102018000003:
determinazione di microplastiche in campit**

Gentili Signori,

Si segnala che abbiamo ricevuto comunicazione al rapporto di ricerca relativo alla Domanda di Brevetto per Invenzione Industriale in oggetto, unitamente alla relativa opinione scritta. Si allegano alla presente i suddetti documenti.

Si ricorda che a seguito dell'accordo stipulato tra l'UIBM (Ufficio Italiano Brevetti e Marchi) e l'EPO (European Patent Office), la suddetta domanda di brevetto depositata in Italia è stata sottoposta ad una ricerca d'antiorità ufficiale da parte dell'EPO volta a definire la brevettabilità dell'invenzione. Tale ricerca contiene altresì un'approfondita ricerca internazionale atta a individuare eventuali brevetti anteriori alla Vs. domanda che, se contenenti rivendicazioni identiche o simili, sono in grado di farle decadere per assenza di novità.

Si precisa che tutti i brevetti anteriori evidenziati con la lettera A sono da ritenersi *non pregiudizievoli per la novità*. Inoltre, il trovato è stato esaminato sotto il profilo dell'*altezza inventiva* ossia dell'originalità.

Nel caso del trovato oggetto della Vs. domanda di brevetto, è stata riconosciuta la novità, l'altezza inventiva e l'applicazione industriale per tutte le rivendicazioni dalla 1 alla 10 pertanto soddisfa tutti i requisiti di brevettabilità necessari al rilascio della domanda.

Per eventuali ed ulteriori chiarimenti in merito rimaniamo a Vostra disposizione.

Cordiali saluti,

De Tullio & Partners Srl



Method Article

Patent method for the extraction and determination of micro- and nano-pl organic and inorganic matrix samples application on vegetables

M. Ferrante^{1,*}, G. Oliveri Conti¹, P. Zuccarello¹

Environmental and Food Hygiene Laboratories (EAL), Department of Medical, Surgi
"G.F. Ingrassia", Hygiene and Public Health, University of Catania, Via S. Sofia 67, 95

ABSTRACT

The uncontrolled introduction into the environment of plastic polym debris, known as microplastics (MPs) that represent an important to threats. So far, the absence of effective and efficient extraction metho with diameters inferior than 10 µm) from complex matrices (water, fo estimation and, the consequent assessment of the health impact assoc contaminants.

In this paper, a new patented method for the extraction and dete organic and inorganic matrix samples is reported. The method appl internationally protected. The code of the submitted request of internat of world is PCT/IB2019/051838 of 7 March 2019, coupled with the ace of March 7 of 2018 entitled "Method for extraction and determination and inorganic matrices". The method applied to our study is based on a higher than 1 µm). The method can be applied to organic and inorga biological sample (blood, urine, tissues, etc.).

After acid digestion of sample matrix, MPs are recovered by sedime are dispersed in metallic stub. Analysis is performed by SEM-EDX.

• New method for the extraction and determination of total microp last
• The method is based on the sedimentation of particles with densit
• The method can be applied to organic (food, soil, biological sample,
• Total micro- and nano-plastics quantification is performed by SEM-F

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2151-0818/20 © 2020 The Author(s). Published by Elsevier B.V. This is an open ac

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Exposure to microplastics (<10 µm) associated to plastic bottles mineral water consumption: The first quantitative study

P. Zuccarello, M. Ferrante^{*}, A. Cristaldi, C. Copat, A. Grasso, D. Sangregorio, M. Fiore, G. Oliveri Conti

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Estimated daily intake
Mineral water
Public health
MPs release
Principal component analysis

ABSTRACT

The uncontrolled introduction into th plastic fragments, known as Microplast study was the first to investigate the concentration of MPs smaller than 10 µm carried out using a patent method rep Therefore, aims of this study were a) 10 µm in mineral waters contained in mineral waters and bottle quality ce human daily exposure to MPs due to The MPs were found in every san 5.42E+07 p/L ± 1.95E-07. The main ε was the number of MPs). The estimat body-weight/day corresponding to 4 correspond to 878 particles/body-we



Comment

Comment on "exposure to microplastics (<10 µm) associated to plastic bottles mineral water consumption: The first quantitative study by Zuccarello et al. [Water Research 157 (2019) 365–371]"

Barbara Oßmann^{a,b}, Darena Schymanski^{c,d}, Natalia P. Ivleva^e, Dieter Fischer^f, Franziska Fischer^g, Gerald Dallmann^h, Frank Welle^{h,*}

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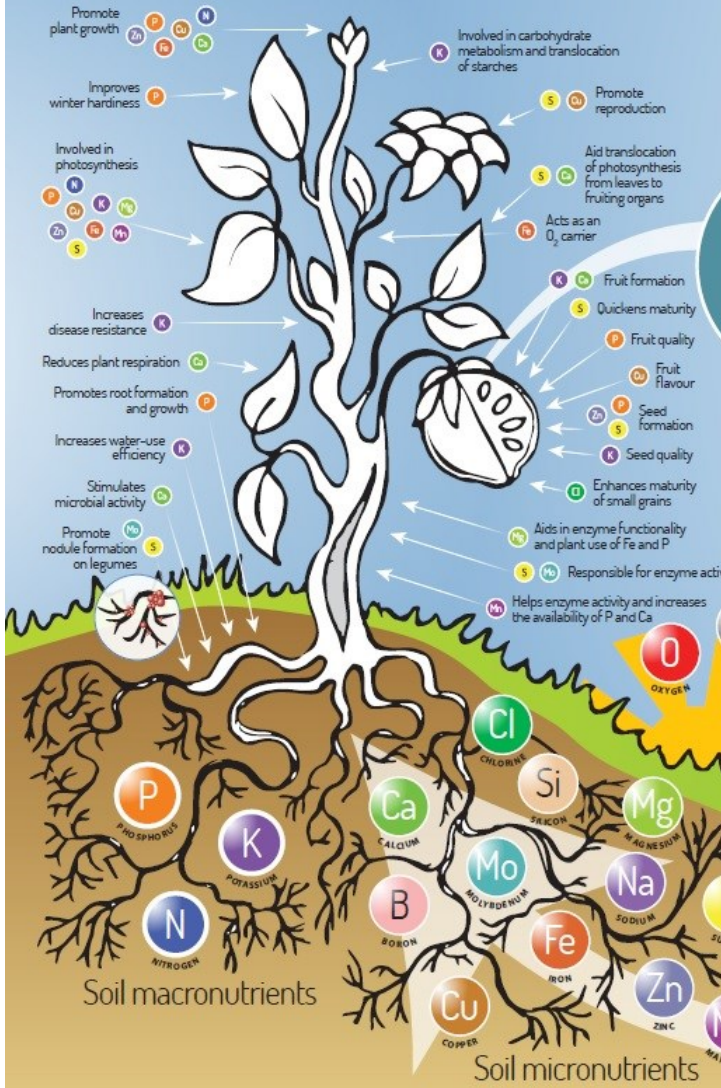
ABSTRACT

Microplastics in food is a relatively new research field with only few studies available so far. Scientists have been pointing out that some of these studies apply questionable analytical methods. Nevertheless, media often use such results to gain attention of the readers. It is therefore of particular significance, that only those scientific studies are published, clearly presenting valid data on the content of microplastics in food. Unfortunately, the study by Zuccarello et al. shows some critical aspects regarding analytical

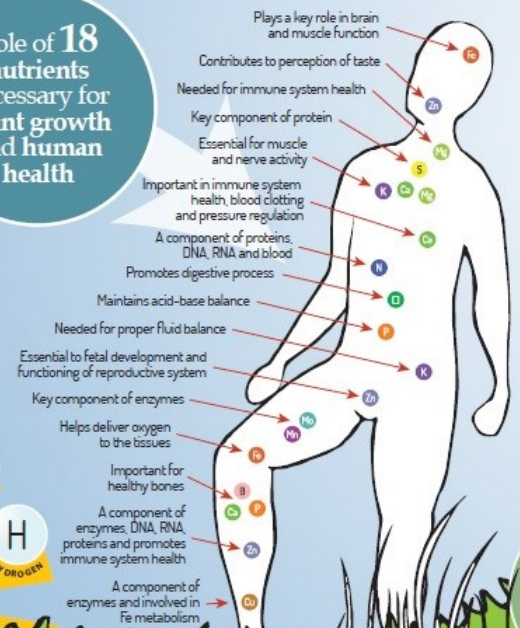


EFFETTI DELLA DIETA SULLA SALUTE

Soil the foundation of nutrition



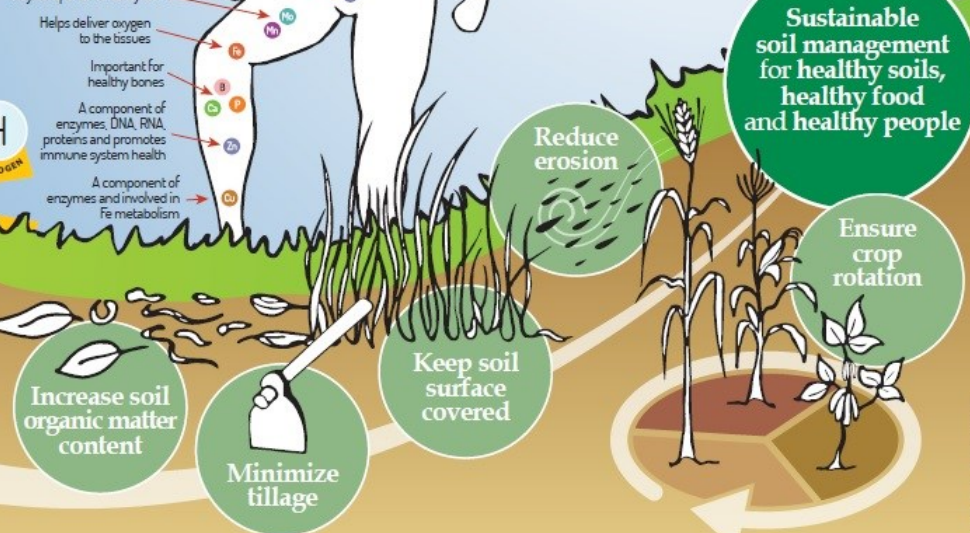
Role of 18 nutrients necessary for plant growth and human health



Soil degradation leads to the loss of soil micro and macronutrients

Nutrient-poor soils are unable to produce healthy food with all the necessary nutrients for a healthy person

Over 2 billion people suffer from micronutrient deficiencies

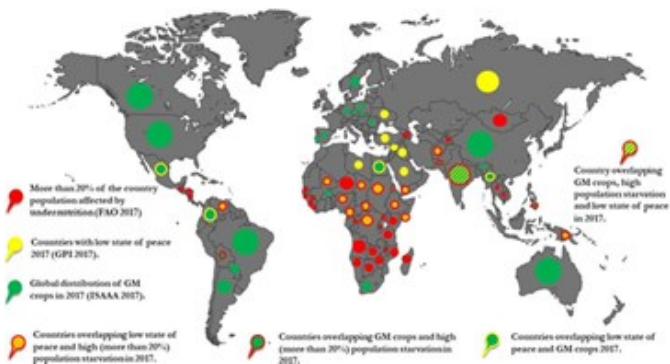


Non tutti gli OGM alimentari sono autorizzati, fra circa venti prodotti autorizzati i più comuni sono mais, soia e colza.



L'Europa nel 2004 ha consentito l'uso di OGM esprimendo parere favorevole alla produzione e commercializzazione di alimenti OGM purché venga adottato il principio della " sostanziale equivalenza "

L'Italia ha da sempre avuto un atteggiamento di estrema cautela e recependo le Direttive Europee 1829/2003 e 1830/2003, REG. 65/2004, Direttiva 412/2015 ne ha consentito l'importazione e l'uso ma non la coltivazione



Il dibattito sull'impiego degli OGM è ancora aperto, sebbene L'EFSA valuti la sicurezza dei nuovi prodotti geneticamente modificati prima che i gestori del rischio assumano la decisione di autorizzazione la commercializzazione.

L'EFSA valuta i potenziali effetti degli OGM sulla salute umana, degli animali e dell'ambiente. Le sue valutazioni si basano su fascicoli di dati scientifici presentati dai richiedenti e su qualsiasi altra informazione scientifica del caso.

L'EFSA applica i principi della valutazione del rischio da OGM tenendo conto dei seguenti aspetti:

Caratterizzazione molecolare: valutazione della struttura molecolare delle proteine di nuova creazione, del loro funzionamento e delle loro potenziali interazioni.

Analisi comparativa: confronto tra pianta GM e sua controparte convenzionale. L'obiettivo è quello di rilevare le differenze di aspetto osservabili nella pianta, come altezza e colore (caratteristiche fenotipiche), e caratteristiche agronomiche, come la resa. L'analisi mette a confronto anche i valori nutrizionali della pianta GM e quelli della sua controparte convenzionale.

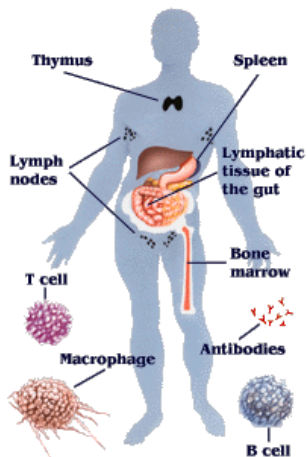
Valutazione della potenziale tossicità e allergenicità.

Valutazione del potenziale impatto ambientale.

Una volta autorizzato dai gestori del rischio, a un OGM viene concessa una licenza per il mercato europeo della durata di 10 anni. Al termine dei 10 anni deve essere valutato di nuovo dall'EFSA prima che qualsiasi decisione alla riautorizzazione venga assunta dai gestori del rischio.



IL SISTEMA IMMUNITARIO



- Complessa rete di mediatori chimici e cellulari
- Difesa dell'organismo (self) da organismi o molecole estranee (non self)
- E' dotato di memoria

REAZIONI AVVERSE AGLI ALIMENTI

If Allergic to:	Risk of Reaction to at Least One:	Risk:
A legume* peanut	Other legumes peas, lentils, beans	5%
A tree nut walnut	Other tree nuts brazz, cashew, hazelnut	37%
A fish* salmon	Other fish swordfish, sole	50%
A shellfish shrimp	Other shellfish crab, lobster	75%
A grain* wheat	Other grains barley, rye	20%
Cow's milk* cow's milk	Beef hamburger	10%
Cow's milk* cow's milk	Goat's milk goat	92%
Cow's milk* cow's milk	Mare's milk horse	4%
Pollen* birch, ragweed	Fruits/vegetables apple, peach, honeydew	55%
Peach* peach	Other Rosaceae plum, pear, cherry	55%
Melon* cantaloupe	Other fruits avocado, watermelon, banana	92%
Latex* latex glove	Fruits kiwi, banana, avocado	35%
Fruits kiwi, avocado, banana	Latex latex glove	11%

REAZIONI NON TOSSICHE

Interessano solo alcuni soggetti particolarmente sensibili

Patogenesi immunologica

ALLERGIA ALIMENTARE

Patogenesi non immunologica

INTOLLERANZE ALIMENTARE

- Di tipo enzimatico
- Dieta di eliminazione

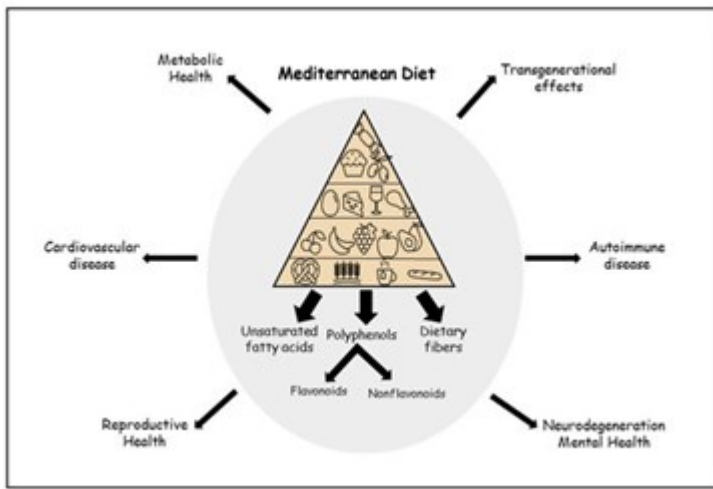
REAZIONI TOSSICHE

Interessano tutte le persone. Dipendono dalla dose dell' alimento

Quantità di tossine nell' alimento

INTOSSICAZIONE ALIMENTARE

- Ingestione micotossine naturali
- Metalli pesanti
- Fitofarmaci



UNA CORRETTA ALIMENTAZIONE AIUTA A PREVENIRE LE MALATTIE CARDIOVASCOLARI

Cosa sono le malattie cardiovascolari?

Le **malattie cardiovascolari** rappresentano la prima causa di morte in Italia. Queste malattie comprendono:



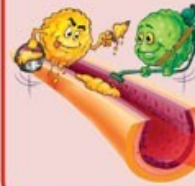
La causa principale delle malattie cardiovascolari è l'aterosclerosi, cioè la formazione di placche che ostruiscono le arterie e che limitano l'apporto di ossigeno e di sostanze nutritive agli organi vitali, come il cuore, il cervello o i reni.

I fattori di rischio per malattie cardiovascolari

Le malattie cardiovascolari sono il risultato dell'azione di diversi fattori di rischio che riconoscono talvolta un'ereditarietà, ma sono spesso **generati da uno scorretto stile di vita**. I principali fattori di rischio cardiovascolare sono:

DISLIPIDEMIA

Si caratterizza per una serie di anomalie dei grassi presenti nel sangue, che comprendono: **L'ipercolesterolemia**, cioè l'aumento del cosiddetto colesterolo "cattivo" o LDL, che si deposita nella parete delle arterie ed è causa di aterosclerosi. **Il valore ottimale di colesterolo LDL è <100 mg/dL.**



Bassi valori di colesterolo HDL o colesterolo "buono", che serve normalmente a "ripulire" le arterie dai grassi in eccesso. Tanto più è alto il colesterolo HDL, tanto più si è protetti dall'aterosclerosi. **Mantieni il colesterolo HDL >= 40 mg/dL se sei un uomo, >= 50 mg/dL se sei una donna.**

L'ipertriglicidemia, cioè l'aumento dei trigliceridi nel sangue. **I valori normali di trigliceridemia devono essere <150 mg/dL.**



DISLIPIDEMIA (25-30% DELLA POPOLAZIONE)



IPERTENSIONE ARTERIOSA (25-30%)



OBESITÀ (10-15%)



DIABETE MELLITO (4-6%)

Mediterranean diet



↑ Minimally processed plant-based foods (e.g. fruits, vegetables, salads, dried fruits)
 ↑ Mono- and poly-unsaturated fatty acids (e.g. olive oil, fish)
 ↑ Fiber intake (complex, insoluble and 'microbiota-accessible' carbohydrates)
 ↑ Phytochemical and vitamin intake
 ↓ Processed food (e.g. red meat);
 ↓ Saturated fatty-acids;
 ↓ Calorie intake;
 ↓ Amino acid intake (e.g. choline, L-carnitine)

↓ Oxidative stress
 ↓ Inflammation
 ↑ Immune function
 ↑ Insulin sensitivity
 ↓ Metabolic syndrome
 ↓ Obesity and type-2 diabetes
 ↓ Low density lipoproteins;
 ↓ Cardiovascular diseases
 ↓ Bowel diseases
 ↓ Colorectal cancers
 ↓ Neurodegenerative disorders

↑ Microbiome diversity
 ↑ Bacteroidetes, Lactobacilli, Bifidobacteria, Faecalibacterium, Oscillospira, Roseburia, Ruminococci, Clostridium cluster XIVa;
 ↓ Firmicutes, Proteobacteria

↑ Microbiota-derived metabolites (acetate, propionate, butyrate)
 ↑ Gut Homeostasis
 ↓ Gut dysbiosis
 ↓ Opportunistic pathogens
 ↓ Gut leakiness

Consigli generali

1. Pratica un'attività fisica aerobica regolare (camminate, bicicletta, nuoto, jogging, ecc.) per almeno 30 minuti al giorno per 5 giorni alla settimana



10 mila passi al giorno
 Ricorda che l'esercizio fisico fa aumentare il colesterolo HDL ed aiuta a bruciare i grassi in eccesso

2. Riduci l'apporto calorico con la dieta (<2.000 Kcal/die).

3. Riduci l'introito di **grassi saturi**, contenuti soprattutto nella carne rossa, nel burro e nei formaggi grassi

Scegli latte e yogurt scremati e formaggi magri (mozzarella, ricotta)

Assumi uova in quantità moderata (meno di 2 volte alla settimana)

Introduci il pesce, ricco di omega-3, che abbassano i trigliceridi, per almeno due volte la settimana



4. Elimina il consumo dei cosiddetti grassi "trans", presenti nelle margarine e nei prodotti con esse preparati e prediligi i grassi mono- e poli-insaturi (olio di oliva o oli di semi, pesce azzurro)

Non superare il 25-35% dell'apporto calorico totale da grassi

5. Aumenta il consumo di frutta e verdura

Le fibre aiutano a controllare l'assorbimento dei grassi alimentari

1. Vegetali contengono sostanze antiossidanti che aiutano ad eliminare i "radicali liberi" che danneggiano le pareti delle arterie

Assumi con moderazione la frutta ricca di fruttosio (banane, cachi, fichi ed uva) se hai i trigliceridi alti



6. Per quanto riguarda i carboidrati:

Prediligi gli zuccheri complessi (pasta, pane, riso, preferibilmente integrali) a quelli semplici contenuti nei dolci
 Ricordati che gli zuccheri si trasformano in grasso se non vengono "bruciati!"

7. Non fumare: il fumo libera sostanze tossiche che danneggiano le arterie, e non eccedere nell'assunzione di bevande alcoliche



Together we will beat cancer

How many cancers can be prevented?

Although there are some things we can't control about our cancer risk, decades of research have clearly shown that by living a **healthier life**, people can reduce the risk of developing the

CANCER PREVENTION and the 2015 DIETARY GUIDELINES

HOW THEY ALIGN

USDA¹



AICR²



FOCUS ON OVERALL DIETARY PATTERN

LIMIT ADDED SUGARS

REDUCE SODIUM INTAKE

VARIETY OF VEGETABLES, FRUITS, WHOLE GRAINS & BEANS

AVOID SUGARY DRINKS

LIMIT HIGH-SUGAR FOODS

LIMIT SALTY FOODS AND FOODS PROCESSED WITH SODIUM



1. U.S. Department of Health and Human Services and U.S. Department of Agriculture. 2015 – 2020 Dietary Guidelines for Americans, 8th Edition, December 2015. <http://health.gov/dietaryguidelines/2015/guidelines/>.
 2. AICR Recommendations for Cancer Prevention. Based on American Institute for Cancer Research/World Cancer Research Fund Food, Nutrition, Physical Activity and the Prevention of Cancer: a Global Perspective (2007).



AICR.ORG





Review

Role of Emerging Environmental Risk Factors in Thyroid Cancer: A Brief Review

Maria Fiore ¹, Gea Oliveri Conti ^{1*}, Rosario Caltabiano ², Antonino Buffone ³, Pietro Zuccarello ¹, Livia Cormaci ⁴, Matteo Angelo Cannizzaro ⁵ and Margherita Ferrante ¹

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² Department of Medical and Surgical Sciences, Anatomical Pathology, Catania, Italy
³ Department of General Surgery and Specialty Vittorio Emanuele P.O. G. Rodolico, University
⁴ Hygiene and Preventive Medicine Specialized Advanced Technologies, "G.F. Ingrassia", Catania
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Received: date; Accepted: date; Published: date

Abstract: Environmental factors are recognized in people. Exposure to radiation, both from natural and inorganic chemical toxicants represents carcinogenicity. Halogenated organochlorine Polychlorinated biphenyls and their metabolic transport proteins, replace thyroxine, and bisphenolates with high mimic ability versus environmental risks represents a very environmental risk assessment and its main the epigenetic origin's theory of cancer. In understand the association between environment



Dietary habits and thyroid cancer risk: A hospital-based case-control study in Sicily (South Italy)

Maria Fiore ¹, Antonio Cristaldi, Valeria Okatyeva, Salvatore Lo Bianco, Gea Oliveri Conti, Pietro Zuccarello, Chiara Copat, Rosario Caltabiano, Matteo Cannizzaro, Margherita Ferrante

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ARTICLE INFO

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Thyroid cancer
Food items
Diet
Risk factors

ABSTRACT

Several studies have investigated the role of diet as a risk and/or protective factor against thyroid cancer, both considering individual foods, groups of foods and dietary patterns, but the results are not coherent. The aim of the study was to investigate the relationship between dietary habits and thyroid cancer. Cases and controls were recruited at the University Hospital "G. Rodolico" of Catania. The dietary habits were defined through the "Lifestyle Assessment Questionnaire". The frequency of consumption of each food item was reported on a 4-level scale (never, one time a week, 2-3 times a week, every day of the week). We computed the odds ratios (ORs) of thyroid cancer and the corresponding 95% confidence intervals (CIs) according to the median of control group daily intake of each food group, using multiple logistic regression models adjusted for major confounding factors. Starchy foods (OR = 1.39, 95% CI 0.63-2.32), insects (OR = 1.39, 95% CI 0.61-2.40) and products rich in salt and fat showed a positive association with thyroid cancer risk. Conversely, an inverse association with disease risk was found for vegetables (cruciferous OR = 0.30, 95% CI 0.10-0.92, non-cruciferous OR = 0.57 (0.20-1.57) milk and dairy products (OR = 0.68, 95% CI 0.40-1.13) and seafood (OR = 0.68, 95% CI 0.24-1.22). An increased risk was observed for consumption of iodized salts (OR 2.06, 95% CI 1.21-3.51), tea (OR = 1.42, 95% CI 0.84-2.41) and cocoa-cola (OR = 3.08, 95% CI 1.53-6.20). Finally, our results confirm the protective effect of a daily water intake of 1-2 L, but unfortunately this quantity is usually consumed by about a quarter of the sample. Dietary habits appear to modify the risk of thyroid carcinoma. A diet with a limited consumption of starchy foods, products rich in salt, fat and sugar and a higher consumption of, cruciferous/non-cruciferous vegetables, milk and dairy products and seafood could be protective towards thyroid cancer. Moreover, the water intake should be increased and the actual need to consume iodized salt should be verified for each subject/area. These results were useful for investigating on salt, if confirmed, they might have important public health implications for the reduction of thyroid cancer through the improvement of dietary habits.

1. Introduction

According to GLOBOCAN 2018 (Global Cancer Statistics 2018) estimates of cancer incidence and mortality, produced by the International Agency for Research on Cancer (IARC), thyroid cancer is responsible for 567 000 cases worldwide. In particular, the global incidence rate calculated for women in 2018 was 10.2 per 100 000 three times higher than in men. Mortality rates are much lower with rates from 0.4 to 0.5 per 100 000 in men and women respectively, and an estimated 41 000 deaths (Bray et al., 2018).

The etiology of thyroid cancer is not well established. The only well confirmed risk factor for thyroid cancer is ionizing radiation (Ron et al.,

2012), although there is evidence that other factors may play a role (Fitzmaurice et al., 2013). History of benign thyroid nodules/adenomas or goiter, sex (women), a diet low in iodine (follicular thyroid cancer) and obesity are known to increase the risk of thyroid cancer (Choi et al., 2014; Dal Maso et al., 2009; Bray et al., 2018; Fiore et al., 2019a; Memoni et al., 2003; Zhang et al., 2013; Franceschi et al., 1999; Peterson et al., 2012). On the contrary, unlike other cancers, cigarette smoking and alcohol consumption were associated with a decreased risk of thyroid cancer (Kishikawa et al., 2012).

Several authors investigated the role of the dietary factors on thyroid cancer risk (Choi et al., 2014; Dal Maso et al., 2009; Franceschi et al., 1991). In particular, goitrogenic foods such as cruciferous vegetables

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scientific reports

OPEN

Exposure to emissions from Mount Etna (Sicily, Italy) and incidence of thyroid cancer: a geographic analysis

Paolo Boffetta ^{1,2*}, Lorenzo Memeo ¹, Dario Giuffrida ³, Margherita Ferrante ⁴ & Salvatore Sciacca ⁵

An increased incidence of thyroid cancer has been reported in the area close to Mount Etna, the largest volcano in Europe located in Northeastern Sicily. We tested the hypothesis that exposure to the emissions from the volcano is associated with thyroid cancer in 186 municipalities from three provinces surrounding the volcano (1.9 million inhabitants). We measured the angle between the bearing of the municipalities and each direction, with special focus on South-East, the prevalent direction of the plume, and conducted a regression analysis on 2003-2016 incidence rates of thyroid cancer, adjusting for distance from Mount Etna, population size, and income. A 10-degree increase in the angle with South-East was associated with a decrease in thyroid cancer rates in the whole population ($n = 0.67$ cases/100,000, $p = 0.002$) and in women ($n = 1.54/100,000$, $p < 0.001$), and were robust to several sensitivity analyses. Similar results were obtained for East-South-East direction. These results support the hypothesis of a potential role of exposure to the plume from Mount Etna in determining the high rates of thyroid cancer. The results need to be confirmed in analytical studies, in which information of exposure to chemicals originating from the volcano, as well as other possible causes, should be carefully measured, molecular characteristics of the tumors and taken into account.

Mount Etna is the largest active volcano in Europe, located in the province of Catania in Northeastern Sicily. Gas emissions from its active summit craters contain a sizeable amount of heavy metals and halogens, including iodine ¹, resulting in measurable human exposure (e.g., ²). Several studies have estimated the proportion that is deposited on the ground in various forms (e.g., aerosol, solid crystals) ³ and the resulting contamination of ground water. Previous studies have addressed the potential impact of Etna volcanic emissions on human health, including multiple sclerosis ⁴, amyotrophic lateral sclerosis ⁵, and several cancers ⁶, including thyroid cancer ⁷⁻¹¹. In particular, an analysis of 2002-2004 incidence of thyroid cancer in Sicily identified a higher rate in Catania province, which was attributed to papillary cancer and was not explained by mild iodine deficiency or industrial activities ¹². These and other authors ¹³⁻¹⁵ hypothesized a role of the volcanic environment, possibly related to the presence of heavy metals and other carcinogens in the aquifer used for drinking water in the surrounding area. We aimed at testing the hypothesis that exposure to the emissions from Mount Etna is an additional route of exposure to carcinogens of volcanic origin that can explain the increased incidence of thyroid cancer, by analyzing the correlation between the incidence of the disease and the angle between the bearing of the municipalities and each direction, with special focus on South-East, the prevalent direction of the plume.

Results

The incidence rate of thyroid cancer in the study population was higher than those reported in other areas of Sicily, and comparable to other high-incidence areas in other Italian regions (Table 1). The median number of annual cases of thyroid cancer by municipality was 0.71, and four municipalities had no cases of thyroid cancer during the study period. The median number of annual cases by health district was 12.82.

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Physical Activity and Thyroid Cancer Risk: A Case-Control Study in Catania (South Italy)

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IMPACT
FACTOR
2-145

Epigenetics and Gene Activation for Improved Health and Longevity



Exercise

- BDNF



Nutritional Factors

- Calorie Restriction
- Mediterranean Diet
- Polyphenols



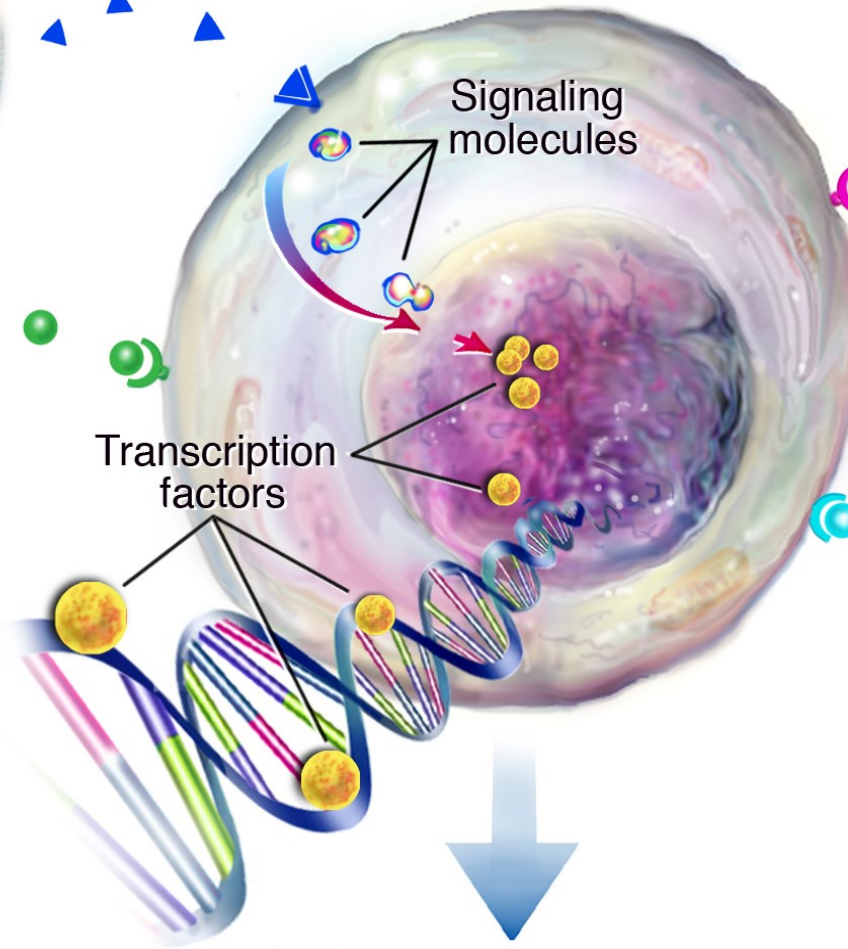
Environment

- Clean air, water and soil
- No smoking



Emotional Health

- Religion
- Meditation
- Spirituality



Anti-Inflammatory
Anti-oxidant, Anti-mutation

MYTH



Brown sugar
is healthier than
white sugar.

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MYTH

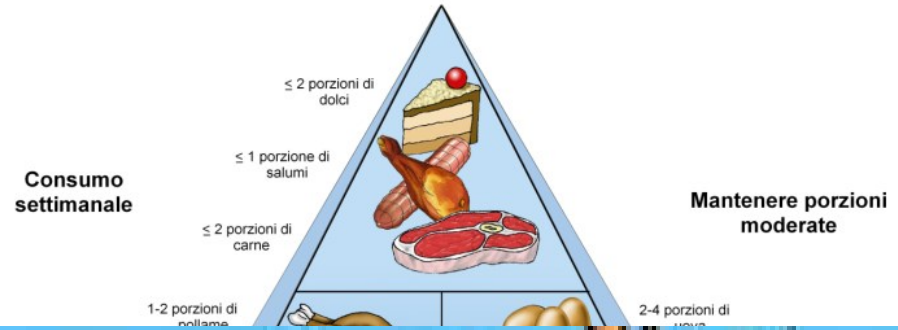


Olive oil is low
in calories.

but it is healthier.

RIGHTSIDE.ME

DIETA = STILE DI VITA



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se

nte



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o valori sc



rischi sanitari legati alla
esistenza di contaminanti
entro i limiti di sicurezza,
o del prefisso "ipo" e dei
nenti.

lergizzante è allergizzante.

é illusa, ma deve essere

soprattutto, bisogna far

attive esposizioni e/o per

prevenitivi gliaffinché ma

itari legati all'alterazione

su fatti concreti e non

GRAZIE