



EGEA^{edition 8}
International conference

NUTRITION & HEALTH

FROM SCIENCE TO PRACTICE

EGEA 2018

November 7th-9th
Marriott Hotel, Lyon - FRANCE

Co-chairs

E. Riboli & M. Laville

Scientific Committee

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JM. Lecerf, L. Letrilliart, K. Lock, A. Martin,
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EGEA 2018 is part of the European program "FRUIT & VEG 4 HEALTH", aimed at extending good food practices through a healthy diet and adequate consumption of fruit and vegetables.

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Vytenis
ANDRIUKAITIS
European Commissioner
for Health and Food Safety
Juncker Commission



Phil **HOGAN**
European Commissioner
for Agriculture and
Rural Development



PREFACE

We are honoured to introduce the booklet for EGEA's 8th international conference, particularly as this year's focus on "*Nutrition & Health: from science to practice*" is very timely. Our society is increasingly aware of the role good nutrition plays in maintaining good health, preventing diseases and hence keeping not only our population healthier but also our economy more resilient. We are responsible for Health and Food Safety and for Agriculture and Rural Development, respectively, therefore we are acutely aware of just how intricately connected these areas are.

We are happy that this unique international conference on nutrition and health is, once again, focusing on fostering multi-disciplinary knowledge and strategies for evidence-based policy making. By bringing together scientists, medical professionals, producers, whole and retail sellers, foodservice and policy makers, EGEA is facilitating the discussion on how to keep our agriculture sustainable, our food nutritious and safe and our population healthy.

Nutrition is one of the most important health determinants. A balanced, nutritious diet helps to prevent a number of chronic diseases, extend life expectancy and improve people's overall quality of life at every stage. This is why the European Commission promotes the "health in all policies" approach, bringing together all sectors and all levels of government.

One child out of three is overweight or obese in the EU – this is a very alarming situation that requires urgent action. We are particularly aware and focused on linking children's nutrition to the European Pillar of Social Rights, together with education, equal opportunities and social inclusion. Our farmers and food producers are working on improving the nutritional quality of food and making healthier food options – with less salt, sugar and fat – easily available and affordable.

Together with EU governments, we are discussing the ways that will help us to apply all possible tools, such as food

labelling, taxation, marketing, education, empowering families and increasing physical activity, particularly in children.

We are moving increasingly towards nutrition-sensitive agriculture and promoting good eating habits more broadly. The EU School Fruit, Vegetables and Milk Scheme is an excellent example of how the EU and our agricultural producers can support Member States to promote healthier eating habits in children. In addition a Teachers Resource Pack has been created to help young people learn more about food production and the wider role played by farmers. Public procurement of food in schools is another tool that Member States can use to improve children's nutrition. Already more than a decade ago, the European Commission launched the European platform for action on diet, physical activity and health. The platform led to more than 300 initiatives designed to promote better nutrition and physical activity in the EU, including a Thematic Network on „Stimulating fresh fruit and vegetable consumption for healthier European consumers., as part of the European Commission's EU Health Policy Platform. And, as recently as June 2018, the Council of the European Union adopted conclusions on "Healthy nutrition for children: the healthy future of Europe".

All these programmes and initiatives, including EGEA's 8th conference, provide a robust framework to address the issue of healthy nutrition and support Member States' efforts to reach the UN Sustainable Development Goals and promote healthy lifestyles. We know that this is a formidable task that requires everyone to work together. It now depends on all of us to put this to use, discuss, cooperate, exchange best practices, learn from our successes and mistakes alike, and achieve sustainable change. Healthy nutrition is definitely one of the best investments we can make together in our future generations.

Vytenis **ANDRIUKAITIS** and Phil **HOGAN**
European commissioners

TABLE OF CONTENT

PROGRAMME	p 5
SCIENTIFIC COMMITTEE	p 9
SESSIONS ABSTRACTS	
D1: NOVEMBER 7TH 2018	p 11
Keynote lecture	p 12
S1 Health promotion in medical education: from rhetoric to action.....	p 13
S2 Persistency of unhealthy habits: Need and right for a healthy diet worldwide	p 15
S3 “The earlier the better”: from pregnancy to breastfeeding, to... ..	p 18
S4 “It is never too late”: food and health in adulthood	p 23
S5 For a healthy diet worldwide: role of general practitioners (GPs) in the win-win solution.....	p 27
D2: NOVEMBER 8TH 2018	p 31
S6 How to make childhood lifestyle healthier?.....	p 31
S7 How to prevent undesirable weight gain in adults?.....	p 35
S8 Childhood obesity care.....	p 39
S9 Preventing obesity related diseases & brain decline.....	p 42
S10 Food contaminants: when we mix science and politics.....	p 46
D3: NOVEMBER 9TH 2018	p 51
S11 Changing consumption due to food system change: the role of marketing, behavioural nutrition and social inequalities	p 51
S12 Helping school children eat healthily: GPs as a vital force for education and impact assessment.....	p 55
ROUND TABLE Considering the roles of key stakeholders in changing F&V consumption.....	p 60
SPEAKERS	p 63
POSTERS.....	p 119
PARTICIPANTS.....	p 153
PARTNERS	p 163
GLOSSARY	p 165

PROGRAMME

D1

NOVEMBER 7TH 2018

8:00 / 9:30

Welcome – Registration – Poster display

9:30 / 10:30

Opening session

Co-chairs: E. Riboli & M. Laville

S. Barnat – EGEA Scientific Coordinator – Aprifel – FR

C. Faurie-Gauthier – Representative of Lyon City Hall – FR

E. Riboli – Imperial Coll. London – UK – Keynote lecture: The role of F&V in disease prevention & health promotion

10:30 / 12:00

S1 Health promotion in medical education: from rhetoric to action

Co-chairs: P. James & M. Laville

- Health workforce for better nutrition – K. Wickramasinghe – WHO Europe – RU
- The primary care professional: an agent for healthy eating? – A. Stavdal – WONCA Europe – NO
- Health promotion in primary healthcare: how well are French clinicians prepared? – M. Laville – C. Bernard Lyon 1 Univ. – FR

12:00 / 12:30

Fruit & coffee break

12:30 / 13:30

S2 Persistency of unhealthy habits: Need and right for a healthy diet worldwide

Co-chairs: E. Riboli & M. Laville

- Why it took so long to define a healthy diet – P. James – LSHTM – UK
- Food security, food safety & healthy nutrition: are they compatible? – H. Walls – LSHTM – UK

13:30 / 14:30

Lunch / Poster Visit

14:30 / 16:00

Parallel sessions**S3 “The earlier the better”: from pregnancy to breastfeeding, to...**

Co-chairs: M. Caroli & D. Weghuber

- Epigenetics and pregnancy
U. Simeoni – Lausanne Univ. – CH
- Dietary diversification: a natural need
ML. Frelut – ECOG – FR
- Complementary feeding: which model?
M. Caroli – ASL Brindisi – IT
- Early chemosensory experiences and subsequent food choices
L. Marlier – CNRS – FR

S4 “It is never too late”: food and health in adulthood

Co-chairs: M. Laville & A. Stavdal

- Prevention of premature mortality related to chronic diseases and F&V intake
T. Norat – Imperial Coll. London – UK
- F&V consumption and cardiovascular disease prevention
M. Verschuren – RIVM – NL
- Modulating the gut microbiota by fiber-rich vegetables: a promising therapeutic approach in obesity?
N. Delzenne – Louvain Drug Res. Inst. – BE
- F&V consumption and mental health
S. Stranges – Western Univ. – CA

16:00 / 16:30

Fruit & coffee break

16:30 / 16:45

Summary of parallel sessions by the 4 co-chairs

16:45 / 18:00

S5 For a healthy diet worldwide: role of general practitioners (GPs) in the win-win solution

Co-chairs: A. Martin & D. Durrer-Schutz

- F&V consumption & chronic disease prevention: What are the possible “wins-wins”?
M. Devaux – OECD – FR
- Promoting a healthy diet through counselling in primary care
D. Durrer-Schutz – EUROPREV – CH
- Importance of F&V in the prescriptions of general practitioners – Feedback from the pre-Egea symposium
A. Martin – C. Bernard – Lyon 1 Univ. – FR

18:00 / 19:00

Poster visit

19:00 / 20:30

Welcome cocktail dinner

20:30

“Le Duo Gourmand”; E. Guilier, *Soprano* & M. Le Bourdonnec, *Piano*

9:00 / 10:30 Registration - Welcome coffee**10:30 / 12:15** Parallel sessions**S6** How to make childhood lifestyle healthier?

Co-chairs: M. Nicolino & D. Weghuber

- Children & adolescents obesity: evolution of prevalence in Europe
A. Rito – INSA – PT
- Little bests in town: how environment and urbanization can drive children's health
D. Van Kann – Fontys University – NL
- Adolescence "the revolution age": How to make a healthy revolution?
A. Vania – Sapienza Rome Univ. – IT
- Diet in pregnancy in relation to subsequent maternal and neonatal health
F. McAuliffe – Univ. Coll. Dublin. – IE

12:30 / 14:00 Lunch – Poster visit**14:00 / 15:30** Parallel sessions**S8** Childhood obesity care

Co-chairs: M. Nicolino & D. Weghuber

- Introduction
M. Nicolino – Woman-Mother-Child Hosp. Lyon – FR
- Psychological profile to become and to stay obese?
A. Tanghe – Zeepreventorium – BE
- Dietary approach to treat obese children
D. Weghuber – PMU – AT
- From physical activity to physical fitness
D. Thivel – Clermont-Auvergne Univ. – FR

15:30 / 16:15 Fruit & coffee break**16:30 / 17:00** Reporting of parallel sessions by the 5 co-chairs**17:00 / 18:30** **S10** Food contaminants: when we mix science and politics (visioconference session)

Co-chairs: J. Ramsay & JM. Lecerf

- Organic vegetable products: from perceptions to scientific realities
MJ. Amiot-Carlin – INRA – FR
- Endocrine disruptors: What are they and where do we go from here?
L. Multigner – INSERM – FR
- Human health risk assessment on the consumption of fruits and vegetables containing residual pesticides
M. Valcke – INSPQ – CA
- Why should we believe the evaluations of official bodies?
J. Ramsay – EFSA – IT

S7 How to prevent undesirable weight gain in adults?

Co-chairs: P. Ouvrard & L. Letrilliart

- Combining physical activity and healthy diet
S. Czernichow – G. Pompidou Hosp. – FR
- How state of the art technology can help people maintain weight loss?
J. Stubbs – Leeds Univ. – UK
- How should nutritional advice be administered during a routine consultation?
JM. Lecerf – Pasteur Inst. Lille – FR
- Fostering collaboration between General Practitioners and Dietitians to improve nutritional patient care
T. Libert – EFAD – FR

S9 Preventing obesity related diseases & brain decline

Co-chairs: M. McCarthy & L. Letrilliart

- Improvement F&V intake in weight management in adults with morbid obesity
G. De Pergola – Bari Univ. – IT
- Improved lifestyle & decreased diabetes risk over 13 years: the Finnish experience
M. Uusitupa – Eastern Finland Univ. – FI
- Current nutrition practices among cardiologists
P. Assyag – French Federation Cardiology – FR
- Diet for the mind: what to eat to prevent Alzheimer's and cognitive decline?
T. Ngandu – N. Inst. for Health and Welfare – FI

D3

NOVEMBER 9TH 2018**7:30 / 8:30****Registration - Welcome coffee****8:30 / 10:00****S11 Changing consumption due to food system change: the role of marketing, behavioural nutrition and social inequalities** (co-organized by N8 Agrifood)

Co-chairs: J. Halford & J. Breda

- Food systems and food choices
C. Reynolds – Sheffield Univ. – UK
- Household food insecurity and promotion of healthy nutrition
A. Linos – Athens Medical School – GR
- Unhealthy food marketing techniques and food consumption impact
E. Boyland – Liverpool Univ. – UK
- Healthy promotion through digital techniques
F. Folkvord – Radboud Univ. – NL

10:00 / 10:30**Poster session awards****10:30 / 11:00****Fruit & coffee break****11:00 / 12:30****S12 Helping school children eat healthily: GPs as a vital force for education and impact assessment**

Co-chairs: W. Kalamarz & M. Caroli

- EU school scheme: a European tool to encourage good eating habits in children
G. Medico – EC – DG AGRI – BE
- School food provision & EU School Scheme experience in Italy
S. Berni Canani – CREA – IT
- The parents' representatives: The unavoidable actors
V. Durin – COFACE – FR
- Joining up tools for optimal school food provision
S. Storcksdieck Genannt Bonsmann – EC – DG JRC – IT

12:30 / 13:30**Lunch****13:45 / 15:45****Round table Considering the roles of key stakeholders in changing F&V consumption**

Animated by K. Lock & P. James

- Introduction: Global benefits of F&V to health and sustainable development
K. Lock – LSHTM – UK
- Panel:
 - A. Delahaye – European Parliament – FR
 - M. Devaux – OECD – FR
 - G. Golfidis – EC – DG AGRI – BE
 - W. Kalamarz – EC – DG SANTE – LU
 - D. Sauvaitre – F&V Sector – FR
 - A. Stavdal – WONCA Europe – NO

15:45 / 16:00**Closing session**

E. Riboli & H. Walls

SCIENTIFIC COMMITTEE

CO-CHAIRS

Martine LAVILLE

C. Bernard Lyon 1 Univ. – FR

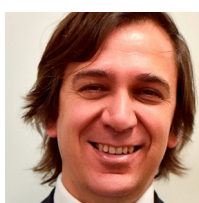


Elio RIBOLI

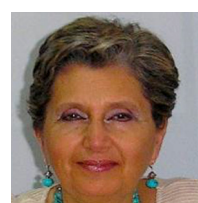
Imperial Coll. – UK



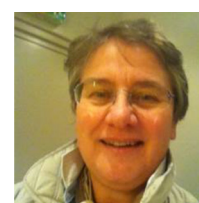
Marie-Josèphe AMIOT-CARLIN
INRA – FR



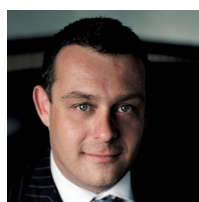
João BREDÁ
WHO Europe – RU



Margherita CAROLI
ASL - Brindisi – IT



Marie-Laure FRELUT
ECOG – FR



Jason HALFORD
Liverpool Univ. – UK



Philip JAMES
LSHTM – UK



Jean-Michel LECERF
Pasteur Inst. Lille – FR



Laurent LETRILLIART
Lyon Univ. – FR



Karen LOCK
LSHTM – UK



Ambroise MARTIN
C. Bernard Lyon 1 Univ. – FR



Teresa NORAT
Imperial Coll.
London – UK



Daniel WEGHUBER
PMU Salzburg – AU



**Stefan STORCKSDIECK
GENANNT BONSMANN**
DG-JRC-EC – IT



DAY 1

D1

Official opening - Welcome


Elio RIBOLI

Imperial Coll. – UK
Humanitas Univ. – IT


Martine LAVILLE

C. Bernard Lyon 1 Univ. – FR
E. Herriot Hosp. of Lyon – FR


Saïda BARNAT

EGEA Scientific Coordinator –
Aprifel – FR


**Céline
FAURIE-GAUTHIER**

Representative of Lyon
City Hall – FR

Keynote lecture

The role of F&V in disease prevention & health promotion

E. RIBOLI – Imperial College London – UK

Over the past decades, very large population based prospective cohort studies have been established to investigate the association of diet, body fatness, physical activity, other lifestyle factors and related metabolic conditions with the risk of developing cardiovascular diseases, cancer, type 2 diabetes, and other chronic diseases. Most cohort studies have reported a consistent association between fruit and vegetable consumption, and reduced risk of coronary heart disease and stroke, and a statistically significant but comparatively less strong association with a reduction of cancer risk. In addition, the results of several cohort studies support a protective effect of fruit and vegetable consumption on all-cause mortality, particularly on the reduction of premature death in middle aged and older adults.

Epidemiological studies have also found that several major lifestyle factors including being physically active and maintaining a lean body mass, avoiding smoking and consuming alcohol in moderation if at all, play a major role in promoting health, preventing chronic disease and reducing premature death. Laboratory studies based on the biosamples collected at baseline in prospective cohorts have shown that these lifestyle factors influence epigenetic changes, hormonal balance, insulin metabolism, antioxidant activity and other pathways of diseases. The application in epidemiologic studies of new methods based on “-omics” is paving the way to a better understanding of the mechanisms underlying the observed associations.

These results have provided the bases for public health recommendations. Current recommendations on fruit and vegetable consumption vary from country to country from 400 g/day (equivalent to five-a-day) in the UK, to 500 to 800 grams per day in Denmark, Norway and USA. The World Health Organization and the World Cancer Research Fund both recommend at least 400 g/day. However, a recent meta-analysis has suggested that the health benefit could increase with levels of consumption even higher than those indicated in current recommendations. This meta-analysis included 142 publications from 95 cohort studies from all over the world and found a significant reduction in the risk of coronary heart disease, stroke, cardiovascular disease, total cancer and all-cause mortality with increase in intake of fruit or vegetables, and fruit and vegetables combined.

While the debate remains open on how much extra benefit can be provided by even higher levels of fruit and vegetable consumption, it is essential from a public health point of view to underlie that decades of epidemiological studies on nutrition and health have shown that low fruit and vegetable consumption is associated with higher risk of several chronic diseases and of premature death and that further health benefits and no detrimental effects have been found for diets characterised by fruit and vegetable consumptions above the currently recommended levels.

S1 HEALTH PROMOTION IN MEDICAL EDUCATION: FROM RHETORIC TO ACTION

Co-chairs: P. JAMES & M. LAVILLE

Health workforce for better nutrition

K. WICKRAMASINGHE & J. JEWELL & J. BREDÁ – WHO Europe – RU

This presentation aims to briefly describe the WHO/Europe workshop series for healthcare workers for nutrition promotion and to provide a summary of a recent WHO review of evidence on integrating nutrition promotion activities in primary healthcare.

Primary care plays a critical role in the provision of services to promote healthy diets, engage individuals in physical activity and assist patients in weight management. A recent review of evidence by WHO/Europe shows that these services are effective in reducing weight, increasing levels of physical activity and shifting to healthier diets. The most effective mix of interventions is strongly associated with context, so that interventions should be tailored to patients' needs and barriers. Services that simultaneously address diet and physical activity are the most effective; initial referral by a primary care physician and routine follow-up by nurses and allied health professionals result in better health outcomes. Many studies reported lack of clear guidance in clinical recommendations; outdated knowledge and competence of primary care providers, including the skills to assess and address patient resistance; unclear scope of practice; and limited work in interdisciplinary teams, misalignment of incentives and insufficient information technology support.

WHO/Europe initiated capacity building programme for nutrition promotion among health professionals working in primary health care, schools and community health centres. Participants had expertise in family medicine, nutrition and dietetics, cardiology, endocrinology and oncology, as well as pediatrics.

Based on this examples, objectives of capacity building programme could be to familiarize health professionals with the important evidence and guidance from WHO on the links between nutrition, physical activity, body composition and weight, and health outcomes. These training workshops can demonstrate, through practical exercises, existing techniques and approaches to: identify important target groups (e.g. pregnant and breastfeeding women, children) and at-risk individuals; monitor dietary intake and levels of physical activity; and monitor child growth and nutrition status in children and adults.

A crucial component of such training is providing an opportunity for participants to learn and experiment with several approaches to brief motivational interviewing through case studies and group workshops. It allows to understand the importance of patients setting realistic goals for themselves and agreeing indicators of success with patients.

Building a health workforce for better nutrition is a long term, challenging task. It requires to identify, discuss and debate potential system changes that could act as enablers, such as the development of new tools or more collaborative working methods. Prioritizing these services in the national health agenda, updating the curricula of health professionals and aligning payment mechanisms for primary care providers will require consideration in order to ensure sustainability and reforms at scale.

The primary care professional: an agent for healthy eating ?

A. STAVDAL – WONCA Europe – NO

Health promotion is most often about making changes in the daily routine, in which eating habits often play a major role.

There is a common understanding that a person's eating habits reflect both societal factors and the individual context.

The family doctor meets people at all stages of life, in continuous relationships with patients over time. In the work of diagnosing and treating, the doctor is an interpreter of signs and symptoms on the basis of the patient's individual context, besides being a teacher and a witness in the course of the patient's life. In the longstanding relationship between doctor and patient, golden moments will occur. Moments when the doctor can give valuable input and be a facilitator for needed change in lifestyle behavior. To achieve that, trust is needed. Trust builds on respect of, and understanding of, the patient's resources and life challenges. When the patient has experienced that the doctor holds this respect and is responsive to his or her needs, change can be a part of the conversation.

There is a lot of information about healthy lifestyle available and the public is often well informed about the basic principles. The hard part is to transform knowledge into action. The person centered approach, the working method in family medicine, is the key to help this transformation come true.

The primary care setting offers an incentive for both parties to reach a mutual understanding of what is at stake, identifying when a crossroad is reached, and agreeing that change is advisable. The patient must feel convinced that reward by a change away from unhealthy habits, will outweigh the prize to be paid and sacrifices made. The doctor must understand what situation the patient finds himself in, and making a judgement whether the moment for introducing a plan for lifestyle change is the right one. The physician must advise the patient not to set the bar too high, be ready for support when setbacks and disappointment occur, helping and nudging the patient to uphold motivation and to stay on track over time.

This talk will focus on how the family doctor can give inspiration and support in the transformation process linked to nutrition and healthy eating.

Health promotion in primary healthcare: how well are French clinicians prepared?

M. LAVILLE – Claude Bernard Lyon 1 University – FR

Medical studies in France are mostly devoted to disease and very few to health promotion. Nutrition, for example, is taught only few hours during the medical courses and is not always taken very seriously by the future physician. However, the need for health promotion is obvious: 80% of adults have sedentary habits, 25% of young over 17y are smokers and 12% take alcohol several times a week. Thus, there was awareness at the government level with prevention of diseases and inequity as main goal.

It has been decided, this year, to add to the medical studies a specific course called "health service" that should be mandatory for all the students working in the medical field (MDs, pharmacists, dentists, nurses...). During these courses they will be trained on promotion of health according to the type of population. They will also have a real life exercise by group going to school, nursing home... to discuss about a health problem. For this first year, nutrition and lifestyle has been chosen as main theme. 50000 students should be trained this year.

S2 PERSISTENCY OF UNHEALTHY HABITS. NEED AND RIGHT FOR A HEALTHY DIET WORLDWIDE

Co-chairs: E. RIBOLI & M. LAVILLE

Why it took so long to define a healthy diet?

P. JAMES – London School of Hygiene & Tropical Medicine – UK

Nutritional thinking was dominated for most of the last century by concepts of vitamin and mineral deficiency but the issue of trying to put this into practical terms for everyday use was left to dietitians and nutritionists. Advising people to eat fruit and vegetables (F&Vs) was based on minimising vitamin C deficiency (scurvy) so very little F&V was required. Then in the early 1980s new policies for preventing coronary heart disease (CHD) by reducing saturated and total fat were introduced with much discussion about the value of F&Vs in CHD prevention because of F&Vs' anti-oxidant properties. Then in 1990 a new approach was taken to develop practical dietary goals for the prevention of major adult chronic diseases. Colon cancer was thought to be partially prevented by more fibre from more whole grain cereal and F&Vs. It was proposed that the average person should eat at least 400g daily of F&Vs to not only prevent constipation but also CHD and colon cancer. This 400 g/d in USA terms was 5 portions since a portion equalled 80g. The amount chosen was based on a) specific Scandinavian and international analyses of diet and colon cancer b) metabolic studies of how much F&V and whole grain cereals were needed for an effective laxative effect c) estimated national Mediterranean F&V intakes, d) continuing evidence that F&Vs could well help prevent CHD and, e) F&Vs' potassium content, helps reduce high blood pressure.

The recent special focus on the effect of sugar in increasing obesity and dental caries means that we should severely limit all sugar intake but this does not include the sugar in F&Vs. Continuing analyses of a wide range of cancers continue

to suggest that F&Vs are beneficial so the challenge is how best to induce substantial increases in F&Vs intake in both children and adults of all ages. Policies geared to population change not only involve changing government agricultural/food policies but also substantial changes in the pricing and availability in all catering facilities funded in any way by government. General practitioners have a role both in terms of individual patient advice and in the way they advise and promote local societal changes.

Recommendations for general practitioners:

1. Ensure you understand what 400g daily of F&Vs means in practice recognising that this is an average figure and adult men should probably be on >600+grams/day; children over 5 years can handle 400 g/d.
2. When asking about a patient's intake it is best to enquire about a household's weekly shop rather than ask about yesterday's intake. Develop 5 practical steps with variety of vegetable and fruit options.
3. Combine some GPs' long standing practice of a health centre displaying a weekly notice about the cheapest F&V options in particular shops/supermarkets and promote changes in providing "free" vegetables and salad bar in local businesses and local government catering by hiding the price in the main meal cost as in the remarkable successful Finland approach.

Food security, food safety & healthy nutrition: are they compatible?

H. WALLS – London School of Hygiene & Tropical Medicine - UK

Food safety, healthy nutrition and food security are each key aspects of food systems with implications for population health. Food safety addresses food-borne illness, and covers the handling, preparation and storage of food. Healthy nutrition is about the nutritional quality of diets, with implications for malnutrition in all its forms, both underweight and associated micronutrient deficiencies, as well as overweight, obesity and associated non-communicable diseases. Food security covers food safety and healthy nutrition, but also relates to what have been described by the Food and Agriculture Organization as the four 'pillars' of food security: availability, access, utilization and stability. This presentation addresses how food security, food safety and healthy nutrition are in one sense absolutely compatible, and in another sense, absolutely not compatible.

Food systems have been conceptualized in various ways, with food safety, healthy nutrition and food security each component of most conceptualizations. The three issues are clearly components of recent conceptualizations of food systems – e.g. a framework of the High Level Panel of Experts on Food Security and Nutrition (2017), the other from the Agriculture, Nutrition and Health Food Environments Working Group (2018). Conceptually, as necessary components of a healthy food system, they are compatible. Thus, the answer to the question posed in the title of this presentation would be 'yes, absolutely'.

However, whilst conceptually compatible, addressing these issues is fundamentally a political issue, and their different characteristics mean that they are considered differently by policymakers. Thus, from the perspective of food system politics, the answer to the question posed in the title of the presentation would be 'absolutely not'.



Addressing these issues on the political agenda requires their political prioritization – which is the extent to which political leaders pay attention to addressing the issue, and back that with resources (financial, technical and human resources). However, rather than being a rational and evidence-based process whereby policymakers prioritise issues based on their importance and act accordingly, policymaking is instead often complex and non-linear, with issues addressed based on stakeholder values and the resonance of them as ideas. Policymakers respond very differently to immediate issues – such as food safety, with its acute implications for food-related health and wellbeing – than longer-term or more chronic issues, such as healthy nutrition. Characteristics of food security such as the emphasis on availability, access and system stability are again different to those of the other two issues – characteristics with different resonance to different stakeholders.

Thus, in terms of their conceptualization, the three issues are absolutely compatible, and in terms of their politics, they are absolutely not. The challenge here for food systems researchers and advocates is to find ways to improve the compatibility of food safety, healthy nutrition and food security from a political perspective, and increase the tractability on the political agenda of all three of these important aspects of a healthy food system.

Recommendations for application in daily practice:

1. Raise awareness in the community of the importance of all three of food security, food safety and healthy nutrition for healthy food systems and population nutrition and wellbeing.
2. Be cognizant that policymaking is not a rational process with decisions often not based on evidence of burden of disease or other impact.
3. Contribute to increasing the political prioritization of more neglected aspects of healthy food systems through, for example: leadership and advocacy that understands political contexts, improved (resonant) issue framing and portrayal, and developing credible measures of the problem (and communicating it in compelling ways).

Parallel session

▶ **S3 “THE EARLIER THE BETTER”: FROM PREGNANCY TO BREASTFEEDING, TO...**

Co-chairs: M. CAROLI & D. WEGHUBER

Parallel session

S4 “IT IS NEVER TOO LATE”: FOOD AND HEALTH IN ADULthood

Co-chairs: M. LAVILLE & A. STAVDAL

Epigenetics and Pregnancy

U. SIMEONI – Lausanne University – CH

Next to our genetic make-up, our environment and lifestyle exert a great influence on our health status. This is especially intuitive for chronic, noncommunicable diseases, such as diabetes and cardiovascular disorders, which are major causes for early mortality. In recent years, more and more data are being published suggesting that chronic diseases at adulthood have early origins during development. Especially, early interactions between the environment and the genome have been shown to shape lifelong trajectories which translate into a healthy life course or an increased risk for chronic disease in the offspring. During the key window of sensitivity constituted by the peri-conceptual period, pregnancy and infancy – the so-called first 1000 days of life –, environmental stimuli such as nutrition, exposure to toxicants or stress, determine lifelong lasting, trans-generationally heritable effects, possibly due to epigenetic imprinting. This concept has been described as developmental or fetal programming, within the general frame of the developmental origins of health and disease (DOHaD). Accordingly, during the sensitive and vulnerable period of early development, stimuli related particularly to stress, nutrition and toxicants do not only have short term effects, but may also influence lifelong and trans-generational health.

Increasing evidence shows that early epigenetic imprinting, which memorizes early interactions between genes and the environment, and translates them into durable changes in gene expression, without affecting the gene sequence, is strongly influenced by the early environment. This is not as surprising as epigenetics are key mechanisms in normal cell differentiation, therefore in organ and function development, by silencing part of the genome which is not involved in the differentiated cell functions, and enhancing the expression of the genes specifically involved in such functions. Arrested development and altered developmental programming, in association with the leveraging effect of the cycle of reproduction are considered as possible factors and may rely on epigenetic changes of genes regulation as a molecular support. Converging findings show that epigenetic imprinting is associated with the level of expression and activity of specific genes involved during development and in the long term setting of the regulation of biologic systems functions, such as those involved in metabolic and cardio-vascular physiology.

Epigenetics molecular mechanisms involved in the early determinants of health and the risk of chronic disease over the life course are based on three principal mechanisms, that involve DNA modifications (e.g. methylation and hydroxymethylation), histones' post-translational modifications (e.g. acetylation, methylation, and ubiquitination) and non-coding RNAs (e.g. micro-RNAs, lnc-RNAs, pi-RNAs). These mechanisms orchestrate genes expression throughout development and at a lower level over the life course without changes in DNA sequence, under the effect of the environment.

The implications for individual and public health promotion are that:

1. Early prevention during the window of opportunity opened by the pre-conception period, pregnancy and early infancy, i.e. oriented toward future parents, pregnant women and infants, is the most efficient and cost-effective public and global health approach to reducing the burden of chronic, noncommunicable diseases;
2. Early prevention should be focused on lifestyle measures, including a healthy nutrition, exercise, exposure to stress and to environmental toxicants such as endocrine disrupting compounds;
3. Personalized or precision approaches should be based on the epigenetic diversity induced by early environmental exposure (epigenome-wide association studies) in addition to genome-wide associations;

Dietary diversification: a natural need

ML. FRELUT – ECOG – FR

Weaning and dietary diversification are key periods in early life. Between 4 and 6 months of age foods will be *added* to milk, but not substituted to it. Energy content, nutrients intakes, tastes will change. Understanding the issues behind these changes is of paramount importance in order to reach nutritional balance and allow adequate growth and development on a short and long term basis.

Milk as a unique food provides both water and nutrients. As a consequence, babies feeling thirsty have to eat while those who are hungry will also be provided water. In breastfed babies (BF), the composition and taste of milk changes over time and are adapted to the most likely requirements: its shifts from a watery consistence when starting to suckle to a fat bulk at the end of the feeding. Hydration is provided before energy needs are fully covered. In non BF babies the composition of the milk, provided as an adapted formula, is constant preventing the baby from such adaptation and fine tune.

Vegetables and fruit are introduced between 4 and 6 months of age in non premature babies. The impact of the complementary food may have opposite effects. Two extreme situations can be observed during the first weeks of diversification: an increase in energy intakes (EI) from new foods while the amount of formula or equivalent as dairies remains stable. In contrary, transitory decrease in EI can take place when vegetables given as starter at lunch time induce satiety and milk or dairies intakes slightly decrease. Providing fruits at the end of the meal or as a starter in the afternoon meal is another way to satisfy the child needs without increasing milk or dairies intakes beyond requirements.

The peak of fatness, as evidenced by BMI curves, is reached between 6 and 12 months of age. Babies also start moving significantly and enhance energy expenditure allowing spontaneous regulation of body composition. In fat babies, vegetable and fruit consumption will provide high bulk low calorie foods and allow limiting milk intakes at their upper level, i.e. 240 ml X 4/day.

Postponing the introduction of sources of starch proves helpful in this case. In lean babies which have not reached the upper limit of milk intakes and have a moderate appetite, new foods may enhance the pleasure to eat and increase energy intakes. In this case, the introduction of vegetables, fruits and carbohydrates from starch and the addition of fat allow enhancing nutritional density of the meal.

Dietary diversification is a necessary and natural process which can be adjusted in order to maintain an adequate growth pattern.

Complementary feeding: which model?

M. CAROLI – ASL Brindisi – IT

Between 6 and 24 months all the infants start to consume solid foods. This period, previously called “weaning”, is now defined as “complementary feeding”. This is an important variation as complementary feeding takes into account the main source of energy in the first year of age: human milk or formula.

Until few years ago paediatricians didn't use to differentiate foods recommendation between infants breast-fed or formula-fed, but this behavior didn't consider the deep and strong difference in human milk and formula formulation. Until milk is the main source of energy, which usually ends at the end of the first year of life, the two groups of infants must be fed in a different way, according the nutritional content of human milk and formula.

Recently, it has been recognized that the nutrition of the first 1000 days of life can have effects until adulthood and, thus, we must be very careful when we recommend complementary feeding.

Weaning is heavily influenced by the habits and culture of the place, but new scientific information must be the basis of choices for the respect of the right to health of children.

Nutrition consists of two branches: one is given by the nutritional and metabolic aspects and the other by the relational aspects. The development of taste is also fundamental to build healthy eating habits since the very early age. Finally, to get a healthy and proper diet for infants we have to know what, when and how much food is right to offer to them.

When. For many years, children have been weaned too early, in contrast with the WHO recommendation which advises to start solid foods at 6 months of age that means 180 days of life.

What and how much. Again, for many years the paediatricians' prescriptions have been very restrictive, giving too many useless rules regarding the order of foods' introduction and portions' size.

In contrast with the previous excess of rules, nowadays a new model of weaning is taking place, the so called “Baby-led-weaning (BLW)”. The BLW affirms that infants since 6 months can eat whatever they decide to eat, from their parents table, as far as they assume by their little fingers, without any limitation in terms of food's kind and serving, as they instinctively know what and how much eating. This is true when we consider the amount of foods, but infants cannot differentiate among protein, fat and sugar foods' content and, thus, they cannot protect themselves from a too high protein or salt or sugar intake. Moreover, many studies have shown that this model cannot satisfy infants' need of iron, calcium, whereas there is an excess of proteins, salt, and often sugar intakes.

This model, furthermore, doesn't take into account the long term effects of the early diet. The other principle on which BLW is based is that this model favours a healthier development of eating habits and that protect from obesity development, but studies on this topic have been conducted with questionable methodology and show conflicting results.

In summary, if we want consider the antique wisdom which says that: "virtue lies in the middle" we could recommend to families who have an infant who has to begin assuming solid foods:

1. Start solid foods at 6 full months: 180 days, according the WHO recommendations;
2. Start with different solid foods considering whether the baby is breastfed or formula;
3. Remember what the baby eats has the same importance as how the baby is fed;
4. Note that the future health of the infant is programmed between 6 and 24 months.

Early chemosensory experiences and subsequent food choices

L. MARLIER – CNRS – FR

Some food preferences are shaped very early during ontogenesis. The perinatal period could even be a key period in building the foundations of our food history. This presentation contains data on the emergence of chemosensory systems, on the traces left by initial gustatory and olfactory experiences, and on the mechanisms that may lead to the channelling of taste in children.

The anatomical data first show that the chemico-sensory systems involved in the perception of foods develop during prenatal life and that gustatory and olfactory receptors in particular are mature at the end of the first trimester of gestation. Moreover, an examination of the chemical composition of amniotic fluid reveals that this fluid contains numerous chemical molecules capable of activating the olfactory and gustatory receptors of the foetus. Some of these molecules, such as sugarcane scented glycolic acid or milky scented lactic acid, are part of its basic composition. Other smells and flavours are transferred to the amniotic fluid according to maternal food choices.

Therefore, many food flavours "colour" the amniotic fluid, and more generally, each meal taken by the mother results in a palette of aromas transferred to the amniotic fluid and to the child.

One of the experimental strategies used to examine the possibility of sensory impressions left by foetal life has been to examine a newly born child's responses to odours extracted from the amniotic environment. Therefore, children exposed in utero to the aroma of aniseed, carrot or garlic demonstrate positive facial responses (smiles, relaxation of the facial muscles) and appetitive oral responses (sucking movements, licking, attempt to seize) towards these same flavours after birth. Such familiarisation processes will continue during breastfeeding, since milk also carries the aromas contained in the maternal diet. Studies show that this early appetite for certain flavours could persist during childhood, even up until adult life.

These perceptual signposts could be acquired through several mechanisms. Firstly, amniotic chemistry could differentially channel the development of certain categories of neuroreceptors, select synaptic connections that are more often activated than others, or skew the expression of certain receptor proteins. Data obtained on animal models show for example that the dominant odour note of amniotic fluid (obtained by aromatising a pregnant female's food) causes the newborn to both a preference and an increased sensitivity towards this aroma compared to a new aroma.

In addition to these peripheral mechanisms, a variety of associative or non-associative cognitive mechanisms could intervene as early as prenatal life. The foetus and the newborn can indeed attribute a positive and appetitive value to an aroma simply by having been exposed to it (mere exposure). But an aroma can also be made aversive by negative conditioning (by intraperitoneal injection of a substance triggering discomfort or by performing an temporary anoxia) as has been demonstrated in animals. This defensive mechanism is reflected later in selective food avoidances. Such mechanisms are not excluded in our own species.

These sensory traces formed during foetal and neonatal life will channel the child's tastes, and are therefore important to allow the child to select their food efficiently, and to open up to a certain dietary diversity, especially in terms of fruits and vegetables, thus promoting their long-term health.

Parallel session

S3 “THE EARLIER THE BETTER”: FROM PREGNANCY TO BREASTFEEDING, TO...

Co-chairs: M. CAROLI & D. WEGHUBER

Parallel session

S4 “IT IS NEVER TOO LATE”: FOOD AND HEALTH IN ADULTHOOD

Co-chairs: M. LAVILLE & A. STAVDAL

Prevention of premature mortality related to chronic diseases and fruit and vegetable intake

T. NORAT – Imperial College London – UK

Fruits and vegetables are part of “healthy” dietary patterns and dietary recommendations or guidelines emphasize the importance of consuming fruits and vegetables. Depending on the country, the recommended amounts vary from 400 grams to 800 grams per day. Cancer and cardiovascular diseases are the main causes of death worldwide. There is evidence that fruits and vegetables can reduce cardiovascular disease risk. However, the evidence that fruits and vegetables can have a role in the prevention of cancers has weakened in the last decades. The most recent and complete evaluation of the scientific data was published by the World Cancer Research Fund (WCRF) in 2018. The WCRF experts concluded that there is strong evidence of a preventive effect of fruits and vegetables against cancers of the mouth, pharynx and larynx but the evidence is weaker for most frequent cancers. For other cancers, the data suggests a protective effect of fruit and vegetable intake on breast cancer (oestrogen-receptor negative) and oesophageal cancers, and of citrus fruits in gastric cancer (cardia). The studies suggest that the risk of lung cancer tend to be lower in smokers with higher fruit and vegetable intake compared to smokers with lower intake, and that low intake of fruits and vegetables may increase the risk of colorectal cancer. Therefore, it is important to examine what could be the influence of fruits and vegetables intake on all-cause mortality in large population studies. A systematic literature review of 95 prospective studies published up to 2016 showed that people with the higher consumption of fruits and vegetables in the studies experienced 18% lower risk of dying than those with the lowest intakes. Similar results were observed for fruits and vegetables when analysed separately. Most of the observed benefit could be attributed to a decrease risk of death for stroke and coronary heart disease during follow-up, although whereas for cancers a 7% lower mortality was observed among higher compared to lower fruit and vegetable consumers. The review also showed a decrease of all-cause mortality with increasing levels of fruit and vegetable intake up to the highest observed intake of 800 grams per day, suggesting that intakes higher than the recommended values of 5 portions a day (approximately 400-500 grams) could contribute to reduce premature deaths.

Fruit and vegetable consumption and cardiovascular disease prevention

M. VERSCHUREN – RIVM – NL

What is the evidence regarding the role of fruits and vegetables in cardiovascular disease prevention? The evidence for dietary recommendations is based mainly on prospective cohort studies. More and more the focus in dietary research is shifting from single nutrients to foods and food groups and to the totality of our diets (dietary patterns). Also with respect to making recommendations to the public, it is easier to formulate an advice based on foods than it is to give advice on the amount of nutrients. People buy and eat foods, and they do not go to the supermarket to buy nutrients. The European Guidelines for Cardiovascular Disease Prevention recommend to eat 200 grams of fruit and 200 grams of vegetable per day.

Prospective cohort studies have shown a protective effect of consumption of fruits and vegetables on cardiovascular diseases. A recent meta-analysis showed that with each 200 g/day increase in fruit and vegetable intake, the risk for coronary heart disease was lowered by 8% (RR 0.92; 95% CI 0.90-0.94), the risk for stroke by 16% (RR 0.84; 95% CI 0.76-0.92) and the risk for cardiovascular disease by 8% (RR 0.92; 95% CI 0.90-0.95). When looking at fruits and vegetables separately, risk reductions were more or less similar. The protective effect of fruits and vegetables was observed up to intakes of 800 grams per day, which indicates that eating more than the current recommendations yields additional health benefits. With respect to fruit, dietary guidelines across the world differ with respect to the recommendation on pure fruit juice. The 2016 UK dietary guidelines state that one portion of the recommended 'five a day' can be replaced by pure fruit juice. Replacing fruit by pure fruit juice might be a practical solution for people to meet the recommendation for fruit consumption when for any reason more fruit consumption is difficult. In contrast, in the Dutch dietary guidelines of 2015 pure fruit juice is classified in the same category as 'sugar-containing-beverages' because of its comparable sugar-content. Therefore, the advice is to keep consumption of pure fruit juice to a minimum. Pure fruit juice contains less dietary fiber and vitamin C than whole fruits. However, pure fruit juice still contains a high concentration of polyphenols, which might reduce the risk of CVD [13-16]. A number of mechanisms are known by which fruit and vegetables reduce the risk of cardiovascular diseases. These include anti-oxidative and anti-inflammatory effects, as well as effects on blood pressure. Fruit and vegetables are a rich source of potassium, vitamins and bioactive compounds. Research is ongoing to unravel pathways by which (different components of) fruits and vegetables influence disease risk.

For dietary advice to prevent cardiovascular disease in every day practice the recommendations are:

1. Eat at least 200 gram fruits per day and 200 gram vegetables;
2. A higher consumption will further reduce cardiovascular risk;
3. Eat a wide variety of fruits and vegetables;
4. Do not replace fruit by fruit juice .

Modulating the gut microbiota by fiber-rich vegetables: a promising therapeutic approach in obesity?

N. DELZENNE – Louvain Drug Research Institute – BE

The gut microbiota composition and functions can be altered in several pathological conditions including obesity and related metabolic alterations, malnutrition, or psychological disorders. In mice models of obesity, we have shown that dietary fibers with prebiotic properties (fructans, arabinoxylans...) lessen adiposity, steatosis, vascular dysfunction and inflammation, namely by modulating the gut endocrine function (differentiation of L cells, production of glucagon-like peptides). Most of the data relating the effect of prebiotics on obesity in humans have been obtained upon dietary supplementation with isolated inulin, either synthesized from sucrose, or extracted and purified from non-edible sources, such as chicory roots. In the context of a multidisciplinary project (Food4Gut project <https://sites.uclouvain.be/FOOD4GUT/>), we have shown that some vegetables locally cultivated in Wallonia (Belgium), contain substantial amount of inulin-type fructans. We have tested the impact of a food-based intervention with those vegetables in healthy volunteers on gastro-intestinal tolerance, behavior, and appetite sensation. The data presented will show how the changes in the dietary habit with such vegetables for two weeks can modulate the gut microbiota composition and activity. This nutritional approach has also been tested in a cohort of obese patients. The data obtained by us and others suggest that the individual response towards nutrition intervention in obesity is namely dependent on the gut microbiota composition. As practical issues, we can propose that 1) some vegetables are particularly rich in dietary fibers with prebiotic properties 2) such food products might be interesting in the management of microbial dysbiosis associated with metabolic disorders and to promote dietary fibers intake and 3) some progresses can be made in the elaboration of adequate intervention studies and in the development of new biomarkers related to microbiota-nutrition interactions. The last objective fits with the ones of the JPI FiberTAG project that will be presented during the meeting (<https://www.fibertag.eu/>).

F&V consumption and mental health

S. STRANGES & K. ANDERSON – Western University – CA

Positive mental health or mental wellbeing has recently emerged as an important predictor of overall health and longevity. Mental wellbeing is more than the absence of mental illness or psychiatric pathology. It implies 'feeling good' and 'functioning well' and includes aspects such as optimism, happiness, self-esteem, resilience, agency autonomy and good relationships with others. Arguments have been advanced that mental wellbeing and mental illness may represent two different but correlated continua. The case for the promotion of mental wellbeing has been advocated on both health and economic grounds, because mental illness is hugely costly to the individual and to society, and lack of mental wellbeing underpins many physical diseases, unhealthy lifestyles and social inequalities in health. As a consequence, mental wellbeing now assumes an important place in mental health and public health policy.

A large body of epidemiological and trial evidence supports the beneficial role of fruit and vegetable intake in general wellbeing and prevention of major chronic diseases across several populations and age groups, including positive effects in the prevention and management of common mental disorders, such as depression and anxiety.

Epidemiological evidence on the behavioural correlates/determinants of positive mental health, as opposed to mental illness, is now emerging. Recent findings from population-based studies suggest that higher intake of fruit and vegetable may be associated with increased odds of high mental wellbeing and reduced odds of low mental wellbeing. Specifically, in cross-sectional analyses from the Health Survey for England on a large nationally representative sample, fruit and vegetable consumption was the health-related behaviour most consistently associated with low and high mental wellbeing; these novel findings suggest that fruit and vegetable intake may play a potential role as a driver not just of physical but also of mental wellbeing in the general population. In addition, several antioxidants found in fruit and vegetables have been shown to be associated with optimism and positive mental wellbeing in middle aged adults. Studies have also reported a dose-response relationship of fruit and vegetable intake with mental health, up to seven portions a day. Fruit and vegetable consumption might also be acting as a proxy for a complex set of highly correlated dietary exposures, including fish and whole grains, which might contribute to the observed associations with mental wellbeing. As most of the epidemiological data is based on cross-sectional studies and given the lack of definitive evidence on potential mechanisms linking fruit and vegetable intake with mental wellbeing, further prospective studies and randomized clinical trials should be carried out to corroborate the causality of the epidemiological data.

In terms of recommendations for the application in daily practice:

1. People should strive to meet recommended dietary guidelines (at least 5 portions, 400g/day); fill their plate with fruits and veggies during every snack or meal;
2. Add more color and variety to diet by trying new types of produce, which will enhance nutritional diversity;
3. Improve home environment by placing fruits and veggies in prominent places;
4. Integrate fruit and vegetables intake within an overall healthy lifestyle.

S5 FOR A HEALTHY DIET WORLDWIDE: ROLE OF GENERAL PRACTITIONERS (GPS) IN THE WIN-WIN SOLUTION

Co-chairs: A. MARTIN & D. DURRER-SCHUTZ

F&V consumption & chronic disease prevention: What are the possible “wins-wins”?

M. DEVAUX – OECD – FR

Obesity and its related non-communicable diseases (NCDs) such as cardiovascular diseases, diabetes, and certain cancers, have a high cost for societies. Treatment cost for obesity-related diseases represents about 10% of total health expenditure in OECD countries, and productivity losses due to obesity-related diseases (e.g. worked hours, absenteeism, early retirement) approximate below than 1% of GDP (Gross Domestic Product).

Unhealthy food consumption, including inadequate consumption of fruit and vegetables (F&V), is a major risk factor for obesity and related NCDs. However, only 12% of European adults report having five portions of F&V daily as recommended by WHO guidelines.

OECD analyses show that low F&V consumption, poor diet and insufficient physical activity tend to cluster in specific population groups, especially among individuals with lower socioeconomic status or lower education level. People-centred public health actions as those targeting individuals at high risk of NCDs, children and younger adult, have the potential to be efficient interventions to promote a healthy lifestyle and decrease the likelihood of obesity.

To tackle NCDs and reduce poor nutrition, countries have adopted a range of policy options, including regulatory policies, communication policies, school-based and worksite interventions, interventions in the primary care setting, reformulation of products, and changes in portion sizes. In particular, a number of policies in place have shown to be effective and cost-effective to reduce the burden of NCDs.

- The most effective policy intervention – but also with the highest implementation cost – is the counselling by a primary care physician and a dietician to people at high risk. OECD analysis shows that the implementation of this intervention in Europe would produce a gain of one year of life in good health in one person every ten. The intervention would become cost-effective in about 10 years after its implementation.
- Mass media campaigns to increase F&V consumption through broadcasts on television and radio channels at national and local levels are common in OECD countries (such as the “5 a day” campaign in Chile, Estonia, Germany, Mexico, New Zealand, Spain, among the others). Mass media campaigns can increase F&V consumption by 18 grams per day, and show positive return on investment a few years after their implementation.
- Food labelling – in store or at restaurant – nudge people towards healthier food choices. For instance, easy-to-understand interpretative labels put in front of packaged food can significantly improve people’s food choices and diet.

Such labels are in place (on a voluntary basis) in Australia and New Zealand (Health Star Rating), Denmark, Norway and Sweden (KeyHole), England (Traffic Light system), and France (Nutri-Score). Likewise, food labelling is effective and cost-effective in tackling NCDs.

- School-based interventions to promote F&V consumption through F&V provision and nutritional education to children, such as the EU School Fruit and Vegetables Scheme, effectively promotes healthier diets and, by having a higher impact on children from families with a low socioeconomic status, contribute to reducing social inequalities among children.

Insufficient consumption of F&V is only one aspect of the obesity and NCDs problem, with high consumption of fat, salt, and sugar, lack of physical activity, and high rates of sedentarity as the other main drivers. The problem needs to be addressed globally because of its multiple dimensions. Key sectors of the economy –beyond the health sector–, such as agriculture, environment, finance, transport, and sport, as well as all stakeholders, have a role to play in obesity and NCDs prevention.

Promoting a healthy diet through counselling in primary care

D. DURRER-SCHUTZ – EUROPREV – CH

A plethora of information (sometimes contradictory) is available, coming from different heterogeneous sources, on the type of diets recommended to remain in good health. This is somehow confusing for the patient. The EUROPREV group (network of EUROpean of GPs involved in global PREvention) has performed a study in 200 centers from 22 European countries to evaluate several issues: 1/ The patients' own judgment about their eating pattern and their physical activity; 2/ The attitude of their GP's regarding nutritional prevention; 3/ What do the patients need to learn about healthy nutrition and how and where to get the information.

The results of the survey were disparate. Considering the global analysis and taking the extreme results, it was found that in France for example, most patients considered to eat a healthy diet, whereas in Lithuania, it was the reverse. Patients confirmed that they want to receive pertinent information directly from their GP's, through leaflets or individual counseling. Recently, we have produced a practical, well-illustrated leporello on obesity issue (which includes nutrition & physical activity), tailored for GPs and entitled: *"Practical visual guide for Obesity Management in Primary Care"*, freely available. Practical recommendations are important for GPs' and patients. According to EUROPREV's view, these can be summarized into 5 points:

1. To promote the Mediterranean diet in primary prevention: a classical meta-analysis has shown a significant reduction averaging 9% in total and cardiovascular mortality, a reduction in cancer mortality of 6% and a large decrease in the incidence of Parkinson and Alzheimer diseases of 13%;
2. To decrease the total sugar intake (saccharose, glucose and fructose) in particular in liquid form (sodas); sugar drinks are considered as "empty calories", are at risks for weight (fat) gain and hepatic net *de novo* lipogenesis. Ultimately this leads to metabolic disorders, in particular when sugars are consumed chronically, in excess of total carbohydrate oxidation;

3. To decrease the consumption of industrialized products: most of these products contain hidden (saturated) fat and sugar and excess added salt. They also can be a source of hydrogenated or trans-fatty acids and are often “polluted” by exogenous food additives;
4. To eat in full consciousness, following the physiological sensation of hunger and satiety i.e. to eat slowly by chewing (masticating) a long time in order to be aware of the different flavors released from the food as well as to ingest food with pleasure and without stress;
5. To stimulate daily life physical activity (not necessarily by being involved in structured and intense sporting activities). As a matter of fact the key message is that we should not dissociate the nutritional aspect from the physical activity one. The reason is that the physiological control of food intake to maintain body weight is much more efficient when the individuals are physically active rather than sedentary;

Finally, let's recall that a WHO Experts Committee (2010) has recommended that both nutrition and physical activity could be “prescribed” by GPs in primary care medicine, reinforcing their important role which goes much beyond the prescription of drugs.

Importance of F&V in the prescriptions of general practitioners – Feedback from the pre-Egea symposium.

A. MARTIN – Claude Bernard Lyon 1 University – FR

In opinion surveys, general practitioners receive a high degree of trust in food and nutrition counselling. But, what is the place of these topics (and especially concerning the role of F&V on health) in their daily medical consultation? What is the influence of their own dietary habits on this counselling? How future practitioners integrate these recommendations into their daily life during their medical studies? What are the expectations of their patients in this area, especially when they want to follow some special regimen? It is this type of questions which have been addressed during the pre-Egea symposium through the presentation of qualitative or quantitative researches carried out by medical residents of the Lyon 1 Medical School during their internship in GP offices, in the context of their initiation to research and the preparation of their thesis of medicine. A better knowledge of the practical realities and of the barriers to the diffusion and use of recommendations of the Nutrition Health Policy Program (PNNS) will help in the future to design adapted tools and communication for assisting GP in nutrition counselling.

DAY 2

D2

Parallel session

S6 HOW TO MAKE CHILDHOOD LIFESTYLE HEALTHIER?

Co-chairs: M. NICOLINO & D. WEGHUBER

Parallel session

S7 HOW TO PREVENT UNDESIRABLE WEIGHT GAIN IN ADULTS?

Co-chairs: P. OUVRARD & L. LETRILLIART

Children & adolescents obesity: evolution of prevalence in Europe

A. RITO – INSA - PT

The WHO Childhood Obesity Surveillance Initiative (COSI/WHO Europe) is an ongoing, systematic process of collection, analysis, interpretation and dissemination of descriptive information for monitoring childhood nutritional status and measuring trends in overweight and obesity in primary school children (6-10). A surveillance initiative which produces comparable data between European countries and allows the follow up of childhood obesity every 3 years. The first data collection took place in the school year 2007/2008 where 13 countries participated. The second round of the study (2009/2010) comprised 17 countries and in the third round 2 more countries joined the study making a total of 19 participating countries. The fourth round had 35 countries from the WHO European Region participating, out of the 40 already enrolled in the study. After almost a decade of its launch, COSI/WHO Europe is now the WHO largest European study with about 300 000 participating children.

COSI involves taking standardized weight and height measurement and the collection of social, family, school environment, diet and physical activity variables through a methodology which follows the common protocol and approach, developed by WHO Europe.

During the last 10 years, COSI data has suggested a presence of an increasing north-south gradient, with the highest prevalence of overweight and obesity found in Southern European countries.

In the last round (4th- 2016) the highest prevalence of overweight in boys was shown in Cyprus (43%), Greece, Italy and Spain (42%) whereas the lowest prevalence of overweight boys was found in Tajikistan (9%); Turkmenistan (11%); Kazakhstan (17%) and Denmark (18%).

Nevertheless, since 2008, a significant decrease in the prevalence of both overweight and obesity was recorded in Greece, Italy, Portugal and Slovenia. Portugal alone showed a downward trend from 37,9% in 2008 to 30,7% in 2016 in overweight children. A decreasing tendency was also observed in Ireland and Spain. Belgium, Czech and Norway have stable prevalences; whereas the picture is less definite in Bulgaria, Latvia and Lithuania. An increasing tendency in obesity was observed among Latvian girls and Bulgarian boys. A similar pattern has been recorded among Lithuanian boys for both overweight and obesity.

Data were also collected on eating habits and physical activity patterns, since these are closely linked to the energy imbalance that results in children becoming overweight and obese. There was considerable variation between countries in relation to frequency of consumption of healthier food items and of less healthy food items, with some countries showing low prevalence of overweight with the poorest healthy food habits (eg. Kazakhstan showing that only 49% of the children had breakfast every day)

There was also considerable variation between countries in indicators of physical activity (going to school by foot or by bike, attending a sports or dance club, and time spent playing outside), media consumption and sleep duration. Walking or cycling to school seemed to be associated with parents' perceptions of the safety of the route and the distance to school.

Little bests in town: how environment and urbanization can drive children's health

D. VAN KANN – Fontys University - NL

Unhealthy lifestyle behaviors and subsequent health risks are still increasing and have reached epidemic proportions. It is expected that approximately 60-70 percent of the population will live in cities. These populous areas tend to increase multiple risk factors for unhealthy lifestyles, such as decreased exposure to green space and increased access to unhealthy food. Contrary, these populous areas provide a range of opportunities which are not present in rural and remote areas, such as increased access to walk and cycle facilities. Further, impact is the result of effectiveness of an intervention multiplied by its reach. However, in many (school-based) health promotion interventions reach is problematic. Recognizing and acting on the opportunities provided by the reach urbanization causes, can transform the challenges in unexpected advantages.

Lifestyle patterns are formed in childhood. As children are 'packed' within broader systems, the school, home, and neighborhood environment, focusing on multiple actors and settings simultaneously is needed. In the home environment, parental practices and modeling behavior are important determinants of fruit and vegetable (F&V) intake. A recent meta-analysis, however, showed only very small increases in F&V intake in successful interventions. School policies to encourage healthy dietary behaviors are also identified as influencing factor, in which direct provision was indicated as strongest associate of higher F&V intake, underlined by a recent meta-analysis that indicated availability as the strongest predictor of F&V intake. Evidence on the effectiveness of exposure to environmental characteristics in the neighborhood on F&V is limited, though a higher density of healthy food outlets seems to affect healthy nutrition positively. Contrary, fast food exposure in the environment is positively associated with BMI. Integrating evidence on environmental characteristics and school

policies would suggest that creating F&V-supportive urbanized environments have the potential to affect children's F&V intake. Environmental changes further enable people to break (un)healthy habits, which have been identified as inhibitor of desired, healthy changes in adolescents.

Considering the broader system in which a child operates and allow interactions between different settings may be key in successfully design health-supportive environments. Successfully designing health-supportive environments is further enhanced by a combined top-down, bottom-up approach. In such a co-design approach, both empirical evidence on environmental influences and local needs by end-users and other stakeholders can fully interact with each other leading to a better fit in the local environment. Integration of needs of end-users further implies customizing interventions (e.g. low SES families), rather than implementing one-size-fits-all interventions. In this strategy, useful generic principles are used which are translated to the needs of the target population, leading to unique urban environments in which it becomes more easy for children and their families to adopt a healthy lifestyle, such as sufficient F&V intake and sufficient physical activity.

Recommendations:

1. Urbanization can be considered as a major chance for creating sufficient impact by F&V and other lifestyle interventions;
2. The creation of health-supportive (urban) environments contain changes in multiple types of environment and should be tailored to the needs of vulnerable populations;
3. Environments in which healthy alternatives take less effort than current unhealthy patterns are most likely to be successful in changing lifestyle behaviors;
4. Supportive environments should be co-designed by end-users to become effective;
5. Focus on the broader system in which children operate; Children are exposed to multiple settings throughout the day. Integrative programs are needed, such as providing healthy alternatives to children in the environment in combination with a supportive (urban) social environment, e.g. role modeling by parents and GP's.

Adolescence “the revolution age”: How to make a healthy revolution?

A. VANIA – Sapienza University of Rome - IT

Adolescence is a well-known pivot of human development. In contrast with the literal meaning, this “pivot” is not a single point or moment but a quite long period of time, going from the first signs of pubertal changes to the end of height growth and cognitive development. This is why adolescence has been divided into three phases: pre-adolescence, adolescence (or intermediate a.), and late adolescence; each of them has different characteristics. During all its duration many aspects of a single person's life are going to change, some of them dramatically. The youth is not the only one facing and coping with them: parents and family, peers, teachers and doctors share the same task. All of them must cooperate, in accordance with their role/age/responsibility, to give rise to the adult which, in embryo, the adolescent contains, and to transform a possibly devastating revolution into a healthy one.

My personal field of interest is, since ever, human nutrition. Supposedly, adolescence does not affect this aspect: a child eats, a teen eats, an adult eats... always the same process, and with the same purpose, isn't it? Actually not. Nutrition is not the same as eating. It includes at least as many relational aspects as biochemical and physiologic ones.

Relational aspects, during adolescence, may outdistance all the others, thus becoming the most important ones, those which may drive the feeding behaviour with such a power as never seen before, and possibly not even after. Let's make some examples, although with a generalisation that does not apply to every single adolescent: as an adolescent, (1) what my family eats easily becomes one more point of friction with my parents, and at the same time one more point to defy. (2) What my peers eat is likely to become "my" model of eating, and (3) what they think of "me" eating something, in turn, can become an unbearable burden. Similarly, (4) what teachers and doctors say about food, proper eating behaviour, and so on, is readily as stupid as all the other topics "adults" are used to speak about, while I start (5) to realise that my eating behaviours can modify my physical aspect, and (6) imagine that I can control any aspect of it, almost in a magical way.

While it is difficult to tell what can make such a revolution a healthy one, it is easier to identify aspects most likely unsuccessful. Adults – including many physicians and health personnel – tend to transfer "their" way of seeing life to the adolescent instead of trying to understand the latter's way of thinking. Picturing frightening scenarios about future health, actively stimulating the adolescent to follow sage adults' example, pointing to a more "adequate" peer (usually not the most popular one), are all examples of unsuccessful approaches. Invert them can be easy to dictate, not as much their (inverted) application.

In my presentation I will try to clarify how using the appropriate communicative register, staying at the same "eyelevel" with the youth, being an influencer, on the contrary, can be more helpful. The final goal of any person dealing with adolescents should be to put themselves at a level where they can grasp what we try to transmit.

Diet in pregnancy in relation to subsequent maternal and neonatal health

F. MCAULIFFE – University College Dublin - IE

Pregnancy is a unique time in the lifecourse where the short and longterm health of mother and baby can be influenced. The increased physiological demands of pregnancy can act as a biological stress test for life to predict a woman's future health. Pregnancy is considered a "diabetogenic state" of insulin resistance, exposure to which may result in long-term alterations of normal glucose metabolism. Gestational diabetes increases the risk of type 2 diabetes in later life, and fasting glucose below levels used to diagnose gestational diabetes are associated with increased adverse maternal outcomes. These effects are more marked in the setting of increased gestational weight gain.

Whether the immediate and lasting effects of pregnancy on a woman's metabolic health and body composition can be influenced through dietary or environmental manipulation is pertinent for all women, but requires further study. Multiple studies have found that maternal dietary intakes are suboptimal both in terms of macro and micronutrients.

In a longitudinal study with longterm follow up of mother and baby following a dietary intervention in pregnancy (ROLO study and ROLO kids) it was noted that mothers' HbA1c at 5 years' post-intervention was associated with early-pregnancy fasting glucose.

Postnatal maternal weight retention was associated gestational weight gain and dietary glycaemic index at 5 years postpartum.

Additionally the *in-utero* environment influences fetal development and may have a lasting impact on offspring and their future disease risk. Nutrition during pregnancy and the maternal environment have been associated with altered body composition at birth and health later in life. Inadequate energy or protein intakes in pregnancy have also been linked with increased risk of non-communicable diseases such as type-two diabetes and obesity.

The ROLO study noted that maternal dietary, glycaemic index, saturated fat intake and lipids associated with childhood adiposity at 2 years of age and that maternal protein intake in pregnancy was related to child weight and length up to 5 years of age.

Recommendations for clinical practice:

1. Improving maternal nutrition in pregnancy requires input from all healthcare professionals involved in maternity care;
2. Improvements in maternal dietary glycaemic index may reduce excessive gestational weight gain and improve maternal glucose homeostasis;
3. A focus on maternal saturated fat intake may be an additional approach to reduce excessive fetal and infant growth and childhood obesity.

Parallel session

S6 HOW TO MAKE CHILDHOOD LIFESTYLE HEALTHIER?

Co-chairs: M. NICOLINO & D. WEGHUBER

Parallel session

S7 HOW TO PREVENT UNDESIRABLE WEIGHT GAIN IN ADULTS?

Co-chairs: P. OUVARD & L. LETRILLIART

Combining physical activity and healthy diet

S. CZERNICHOW – Georges Pompidou European Hospital - FR

According to the World Health Organization, excess weight affects 1.9 billion adults worldwide, of whom 650 million are obese. The obesity classification is based on the body mass index (kg / m²), which classifies individuals at population level. While this criterion does not make it possible to classify individuals at individual level, it does serve to compare populations with each other and to define risk levels.

Several population studies have shown the role played by the urban environment on the prevalence rate of obesity. For example, a Canadian study has found that in neighbourhoods with more areas where walking was possible, the obesity rate increased at a lower rate over the years. This highlights that accessibility to physical activity is important in terms of ability to change behaviours. Similarly, an intervention study showed that neighbourhood poverty levels influenced the prevalence of obesity in the neighbourhood. Finally, the implementation of several public health programmes, for example the National Health Nutrition Programme (PNNS) in France, are important elements in accommodating lasting behavioural changes at population level.

At individual level, there are now many intervention studies highlighting the role of dietetics and physical activity in weight control. Beyond simply reducing calories in a moderate, controlled manner over several months, controlling portion sizes and reducing the energy density of food has been shown to be important in weight control.

Finally, the latest American recommendations recall the essential role of frequent and regular consultation and follow-up, at least every 15 days at the beginning of care, in order to provide effective dietary advice and monitor weight changes over several months. This highlights the importance of nutritional treatment compliance but also the difficulty of successfully achieving it over the long term. New technologies may help to provide this type of monitoring for both patients and physicians.

How state of the art technology can help people maintain weight loss?

S. STUBBS & C. DUARTE – Leeds University - UK

Predictors of weight loss maintenance (WLM) can be either physiological or psychological characteristics of subjects, processes of behaviour change or intervention components with which participants engage during attempted weight loss (WL) and WLM. Almost half the adult population make a weight loss attempt (WLA) each year; 80% of such attempts are subject to weight regain, largely due to eating rather than physical activity behaviours.

Predictors and correlates of outcomes vary between individuals and can change between phases of WL and attempted WLM. In many models of WL and WLM: (i) predictors explain relatively little (~ 20-30% of the variance in longer-term weight outcomes; (ii) many predictors are the sum of several small constituent variables, each accounting for a small proportion of the variance; (iii) inter-individual variability in predictors and correlates of outcomes is high (iv) most of the variance remains unexplained.

Initial weight loss is achievable in the short term but it leads to changes in physiological and emotional systems, which can increase the probability of weight relapse. Ultimately we need a better understanding of the interplay between physiology and behaviour to develop adaptive strategies of long-term weight loss. It is currently unclear how rate, extent or specific WL approaches predict subsequent WLM. Behaviour change techniques associated with self-regulation of activity and eating behaviour (e.g. goal setting, action plans, self-monitoring, relapse prevention plans) and aspects of motivation are important for WLM. Evidence that stress management and emotion regulation may be important for relapse prevention is strongly suggestive but less concrete.

Greater standardisation of predictive constructs and measures of energy balance behaviours, in more clearly defined study populations, tracked longitudinally would improve prediction of who is likely to maintain weight loss or relapse. Modelling within and between-subject patterns of variability in behaviour, and identifying effective mediators of both sustained behaviour change and relapse are central to understanding and improving longer-term WLM. Such studies require multidisciplinary collaborations that link mechanistic research to innovative interventions and knowledge exchange to have an impact on the weight and health of the population.

Recommendations and applications:

1. There are now standardised behavioural change taxonomies to characterise and quantify the active components of behavioural interventions, but there is a need to develop an equivalent framework to profile appetitive, psychological and behavioural energy balance characteristics of participants entering weight management programmes;
2. Eating behavior profiles will help us better match WL intervention components to specific energy balance behaviours of individuals;
3. Tracking technologies should be used routinely used to accurately track energy balance behaviours throughout WM interventions;
4. By combining state of the art digital tracking technologies and data aggregation capabilities it will be possible to develop a Behavioral Energy Balance Framework that will greatly enhance personalised self-monitoring of energy balance behaviours during WMAs;
5. Analytical and predictive frameworks specifying how energy balance behaviours change over time will lead to the next generation of WLM interventions using novel screening, tracking and personalised-navigation tools.

How should nutritional advice be administered during a routine consultation?

J.M. LECERF – Pasteur Institute of Lille – FR

Patients do not consult a practitioner on the grounds of prevention. Apart from vaccination, prevention is not considered a medical act by the practitioner. Yet there are many opportunities to approach prevention: either the doctor can prompt the patient or he can take advantage of health problems raised by the patient. Nutrition is an ideal subject on which to engage in dialogue and give advice.

1. The patient comes about an acute pathology, an infection for example. He can be reminded of the importance of diet and lifestyle for the immune system, the need to stay well hydrated and consume fruits and vegetables.
2. The patient comes about a chronic pathology (e.g. coronary heart disease, high blood pressure, cholesterol, diabetes). This opportunity can be used to remind him that drugs do not replace nutrition.
3. The patient comes for a prescription renewal, a vaccine or an “administrative” consultation (certificate). It is also an opportunity to check his weight or blood pressure and tell him that people are on hand to give dietary advice.
4. It is also possible to approach prevention by advising other people in the family, especially regarding the diet of a child or elderly person.
5. Sometimes the patient spontaneously asks a question about diet or weight. You must always answer him. Potentially offer a longer consultation on another occasion.

Advice should not be given in excess. It must not be judgmental. It must not be too categorical. It must take into account the patient's habits and therefore may not be standard. It must be cautious, "positive" and caring. You must be able to repeat it. It must be precise and accurate. If the doctor does not know the answer to a question, he must make enquiries. The patient's readiness to listen must be taken into account.

All in all, some recommendations:

1. Every opportunity to address a prevention issue should be taken;
2. The doctor is doing his job when he spends time on prevention. It is a medical act;
3. He must be personally convinced of the importance of food and healthy living;
4. It is important to explain to the patient how and why this recommendation affects his health.

Fostering collaboration between General Practitioners and Dietitians to improve nutritional patient care

T. LIBERT – EFAD - FR & E. NEWMANN - EFAD - FR

Improving the nutritional status of the population is a major challenge for Public Health policies in Europe and worldwide. Dietitians are experts in providing nutritional and dietetic care and are employed in different health care settings. Nutritional care in the community and primary care will become more important. This is caused by ageing of the population and associated prevalence of diseases in older adults. In addition, there is a growth of outpatient surgery and decreased length of stay in hospitals, which accentuates the need for patient nutritional care outside the hospital. To provide optimal nutritional care outside the hospital, dietitians and general practitioners (GPs) need to collaborate. In the present study, the current situation in different European countries regarding collaboration between GPs and dietitians was investigated.

A survey was conducted among the 27 European national associations of dietitians, all EFAD members, to clarify the current situation regarding the cooperation between GPs and dietitians.

All the associations that responded (N=18) find that general practitioners do not make optimal use of the expertise of dietitians in their country. There is a lack of awareness of the profession of dietitian, as well as its added value for the nutritional monitoring of patients. On the other hand, dietary counseling is not reimbursed in most of the countries surveyed, which is also one of the reasons why GPs do not refer to dietitians. According to dietitians, collaboration between GPs and dietitians should be improved in order to provide optimal nutritional care. How this collaboration could be improved needs to be studied.

Parallel session

► **S8 CHILDHOOD OBESITY CARE**

Co-chairs: M. NICOLINO & D. WEGHUBER

Parallel session

S9 PREVENTING OBESITY RELATED DISEASES & BRAIN DECLINE

Co-chairs: M. MCCARTHY & L. LETRILLIART

Psychological profile to become and to stay obese ?

A. TANGHE – Zeepreventorium De Haan – BE

The presentation will successively deal with the psychological models to explain for the onset or maintenance of child obesity.

Five psychological perspectives on childhood obesity are selected. The boundary model of Herman & Polivy (1980) was brought forward as an explanation model for understanding the overeating behaviour in obese people. Others describe obese children as overresponsive to external cues and this overresponsiveness is seen as a personality trait. Learning theories put forward how (dysfunctional) learning mechanisms can explain also why obese people eat in front of food cues, without feeling hungry. Finally, obesity can be seen as an expression of a family pathology or an emotional problem.

Psychological explanation models are still subject of discussion. Personality variables, eating behaviour, restraint attitudes, psychopathology and emotional factors, learning mechanisms as well as the role of the family are to be considered in an assessment process. It may help to better empathise with both parent and child. Furthermore, it can help to tailor the treatment program to the individual needs of an obese child. Further research is needed to find out whether already during the intake psychological indicators can be found that are predictors of negative therapy outcome.

Dietary approach to treat obese children

D. WEGHUBER – Paracelsus Medical School – AT

Dietary patterns learnt early in life track into later childhood and adulthood and form the basis for future eating patterns. Meta-analyses have clearly demonstrated that multidisciplinary interventions for the treatment of children who are overweight or obese are more effective the younger the child is. The main objective of treatment is a permanent change in the child's eating habits and lifestyle, rather than attaining rapid weight loss through low-calorie diets. It is pivotal to involve the whole family and set realistic goals.

Starting point of the educational process is the assessment of the child's and the family's dietary habits by means of the assessment of meal composition, portions, frequency of food intake, food preferences or aversions, use of condiments, cooking methods and food presentation as well as drinking habits.

Dietary advice includes to eat five meals a day (three meals and no more than two snacks), to have adequate breakfast, to avoid eating between meals, to avoid high-energy and low nutrient density foods (e.g. sweetened or energizing drinks, fruit juices, fast food, high energy snack) to increase the intake of fruit, vegetables and fiber rich cereals and to limit portions.

Currently, there are no randomized controlled trials examining the effects of different diets on child's or weight and body composition, regardless of potential confounders such as treatment intensity, behavioural or physical activity strategies. A hypocaloric diet can be considered as initial step within a long-term strategy, but needs to fulfil recommended minimal energy and macro- and micronutrient intake levels based on sex, age, and ideal weight for stature, and warrants close medical surveillance in specialized paediatric centers. Replacement meals are not recommended due to lack of evidence of efficacy and safety. No significant lasting effect has been demonstrated for diets with specific macronutrient composition. This includes diets with low glycemic index and load. Traffic light and modified traffic light diets are used to achieve reduced caloric intake through categories of foods grouped by nutrient density and might be effective even in the long-term.

Given the fact that obesity is a chronic disease and the limited effect of treatment in the long-term, the development and validation of chronic care models is mandatory. A system-wide approach for screening and early identification of children who are overweight or obese with clear referral pathways for further assessment and treatment is the foundation for efficient multi-disciplinary concepts of weight management service delivery.

Recommendations for the application in daily practice:

1. It is pivotal to involve the whole family and set realistic goals. Starting point of the educational process is the assessment of the child's and the family's dietary habits.
2. Dietary advice includes to eat five meals a day (three meals and no more than two snacks), to have adequate breakfast, to avoid eating between meals, to avoid high-energy and low nutrient density foods (e.g. sweetened or energizing drinks, fruit juices, fast food, high energy snack), to increase the intake of fruit, vegetables and fiber rich cereals and to limit portions;
3. No significant lasting effect has been demonstrated for diets with specific macronutrient composition. This includes diets with low glycemic index and load;
4. Traffic light and modified traffic light diets are used to achieve reduced caloric intake through categories of foods grouped by nutrient density and might be effective even in the long-term.

From physical activity to physical fitness

D. THIVEL – Clermont Auvergne University - FR

Exercise interventions (combined with dietary restrictions) are first line strategies to treat pediatric obesity and the promotion of active lifestyle from the youngest age is essential to prevent its development. While encouraging adults to exercise and engage into physical activities remains difficult, this is particularly true when it comes to children and adolescents, especially overweight and obese ones. Physical abilities and capacities evolve over childhood and each step is crucial to properly develop adults' physical fitness that will be determinant for physical activity level.

While the lack of physical activity is most of the time incriminated for its role in the development of overweight and obesity in youth, practitioners have to consider the physical impairments and limitations induced by obesity that limit the children and adolescents' engagement into activities.

Practically, practitioners have to structure their clinical assessment in order to:

1. Identify simple and clear indicators of the patient's physical activity level (active transportation, physical education, etc.);
2. Determine the nature and time devoted to sedentary behaviors.
3. Determine whether there are barriers to movement (does the patient report difficulties in performing activities of daily living such as climbing stairs, tying shoe lace, showering, jumping, skipping, etc.);
4. Identify whether additional assessment and treatment will be required (identify indication that the child has physical or psychosocial barriers that might limit participation in physical play?) and refer to an adapted physical activity specialist if needed.

After a brief presentation of the main physical activity guidelines and first necessary steps that must be considered by practitioners, this presentation will try to identify the main physical limitations induced by obesity in youth.

Parallel session

S8 CHILDHOOD OBESITY CARE

Co-chairs: M. NICOLINO & D. WEGHUBER

▶ Parallel session

S9 PREVENTING OBESITY RELATED DISEASES & BRAIN DECLINE

Co-chairs: M. MCCARTHY & L. LETRILLIART

Improvement F&V intake in weight management in adults with morbid obesity

G. DE PERGOLA – University of Bari – IT

Multiple lifestyle strategies may reduce the incidence of obesity, and one of them includes an increase in fruit and vegetable (F&V) consumption, even though the findings regarding the benefits of F&V on weight control are still inconsistent. Some studies reported that higher F&V consumption reduced weight and BMI, whereas others did not find such relationship. A meta-analysis of human randomized controlled trials concluded that there was no empirical evidence that increasing F&V would have a discernable effect on body weight. Another systematic review suggested that the inverse relationship between F&V consumption and adiposity among overweight adults was weak. However, a recent meta-analysis showed that high intake of fruit was inversely associated with weight change; although no significant changes were observed for vegetable or combined F&V consumption. The most recent epidemiological study on this topic (China Health and Nutrition Survey) examined prospectively the relationship between change in F&V consumption, weight, and change in BMI in a total of 4357 adults. The authors showed that, independently of potential confounding factors (age, BMI, education level, total energy intake, physical activity, alcohol and smoking), an increase in F&V consumption by 100 g was associated to significant weight loss (211 g) and decrease in BMI (0.94 kg/m²) in men ($P < 0.001$), whereas the changes did not reach the significance in women. Potential reasons for sex difference might be explained by less vegetable consumption in women compared with men. Moreover, different socio-economic factors and hormone level between genders could also influence weight gain. There are several hypothetical mechanisms by which F&V may be protective against obesity. One potential explanation for weight reduction by F&V consumption may be a decrease in the total energy intake. Furthermore, several components of F&V, such as fiber content, glycemic load (GL) and polyphenols, might also be responsible for their anti-obesity effects. Fibers in F&V increase satiety, reduce hunger feeling and energy intake, and prevent weight gain. In addition, lower-GL of F&V produces fewer and smaller postprandial glucose spikes that may decrease subsequent insulin levels and hunger. Also, diets with low-GL or low-glycemic index (GI) may increase resting energy expenditure, promoting weight maintenance. Moreover, polyphenols may influence insulin sensitivity, gut microbiome, and adipose tissue metabolism.

On the basis of the above data and previous information, I would suggest the following recommendations to apply in daily practice:

1. To eat not less than 5 daily portions of F&V, 3 of vegetables and 2 of fruits;
2. To eat F&V of different color;
3. To keep in mind that juice is not fruit: fruit juice is a sweet drink;
4. To eat whole grains and legumes.

Improved lifestyle & decreased diabetes risk over 13 years: the Finnish experience

M. UUSITUPA – University of Eastern Finland - FI

The prevalence of type 2 diabetes (T2D) is increasing worldwide. The main risk factors for T2D are overweight and obesity and sedentary lifestyle. Furthermore, the quality of diet may play a role in the development of T2D. Interest for prevention of T2D aroused already in 1980s, and the first controlled prevention trial, the Chinese Da Qing IGT and diabetes study with three intervention clinics arms and a control arm was published in 1997. In that study both diet and exercise and diet + exercise combined decreased the incidence of T2D among individuals with impaired glucose tolerance (IGT). The Finnish Diabetes Prevention Study was started in 1993 in five centers in Finland. Altogether 522 middle-aged obese individuals with IGT were randomized into intervention or control groups. The main goals of the intervention were weight loss, improving the quality of diet (more dietary fiber and less total and saturated fats) and increasing exercise. Dietary counselling was intensive with seven sessions during the first year of the intervention. Control group received general instructions about healthy diet and lifestyle. The original study lasted 3.2 years, but both groups were followed for over 10 years. Lifestyle intervention resulted in 58 % reduction in the incidence of T2D and the group difference remained significant over the whole follow-up period. Adherence to lifestyle changes was related to long-term success. The incidence of T2D was lowest in the group who had a high fiber but low-fat diet that was based on the frequent use of fruit, vegetables, local berries and whole grain products, e.g. from oats and rye, and low-fat/fat-free milk products. Intervention was effective independent of family history of diabetes or genetic risk score. However, no difference were found in major cardiovascular events between the intervention and control groups, but lifestyle intervention resulted in significant reduction in early diabetic retinopathy in a subgroup analysis of 214 study participants. Furthermore, lifestyle intervention had beneficial effects on low grade inflammation, blood pressure and serum triglycerides. Today, some 10 well-controlled trials have confirmed the benefits of lifestyle changes in the prevention of T2D in individuals at high risk for T2D, including the American DPP study published in 2002. To conclude: T2D is preventable by changing lifestyle with permanent weight loss, healthy dietary choices and increasing physical activity, and lifestyle changes have sustained beneficial effects for many years after the active intervention.

Current nutrition practices among cardiologists

P. ASSYAG – French Federation of Cardiology - FR

In France, cardiologists practice their profession in a hospital or practice to provide care and treat patients with cardiovascular disease, according to the latest recommendations of learned societies. As a result, cardiologists often find that they need to provide advice to promote a balanced diet. In this context, we at the French Federation of Cardiology have decided to conduct a survey into current nutrition practices among cardiologists, in partnership with APRIFEL. This survey involved 200 hospital and private practice cardiologists and may be summarised as follows: This is a low priority area for cardiologists. Indeed, in terms of prevention, cardiologists regularly support their patients with giving up smoking, suggest regular physical activity and, less frequently, a balanced diet (5 pieces of fruit and vegetables a day, oily fish, lean meats, etc.) with moderate consumption of salt and alcohol.

Nutrition remains a secondary topic with only 4.3 patients out of 10 on average who spontaneously ask for advice on diet in order to prevent cardiovascular diseases.

The second lesson from this survey is that cardiologists say they give nutritional advice on average to 6.5 out of 10 patients, a minority use educational materials and instead use laboratory brochures. Nearly 8 out of 10 cardiologists recommend a nutrition specialist to help their patients lose weight.

Thirdly, in addition to the lack of time mentioned by half of cardiologists, they suffer from a lack of training to improve their support for patients. Nearly 8 out of 10 cardiologists consider the topic difficult to explain to their patients. Cardiologists are aware of the complexity of this area and are open to the idea of better support; this would come from materials but also complementary training as expressed by nearly 8 out of 10 cardiologists.

Which actions for improvement are recommendable?

First and foremost, this area is part of the national health strategy put in place by the French Ministry of Health, which combines a balanced diet with regular physical activity.

Thus, the French Federation of Cardiology will continue to produce and disseminate educational materials on nutrition written by health professionals in this area of cardiovascular disease prevention.

Diet for the mind: what to eat to prevent Alzheimer's and cognitive decline?

T. NGANDU – National Institute for Health and Welfare (THL) - FI

With the aging of the population, number of persons living with dementia, Alzheimer's disease and cognitive impairment is expected to increase rapidly. Prevention plays a key role in reducing or curbing this epidemic worldwide. There is increasing evidence from epidemiological studies linking various modifiable risk factors throughout the life course with the development of dementia. Of particular interest are lifestyle factors like diet and physical exercise.



Several single nutrients and dietary patterns (eg. Mediterranean diet, MIND-diet) have been shown to be associated with risk of dementia and cognitive impairment. Randomised controlled trials (RCTs) targeting these factors are much needed to prove the associations, yet these studies pose methodological challenges. Given the multifactorial etiology of dementia and late-onset AD, multi-domain interventions targeting several risk factors and mechanisms simultaneously are most likely to be effective.

This presentation gives an overview of recent nutritional trials and multimodal interventions and discusses future directions in the field.

The Finnish Geriatric Intervention Study to Prevent Cognitive Impairment and Disability (FINGER) is a pioneering trial providing the first evidence from large RCT that a multi-domain lifestyle intervention may prevent cognitive impairment. The results of this study will be presented with particular focus on the nutritional component and participant compliance to the recommended dietary changes. New results concerning secondary outcomes and sub-group analyses will also be presented.

Building upon the experience from the FINGER and the LipiDiDiet trial, the MIND-AD project (Multimodal preventive trials for Alzheimer's Disease: towards multinational strategies) has been initiated. In this ongoing trial, a multidomain lifestyle intervention is tested along with a nutraceutical product for persons with prodromal AD.

FINGER represents a pragmatic model, which is now being tested in diverse populations and settings (Europe, USA, China, Singapore, Australia). To promote synergy across these trials and optimize efforts towards dementia prevention, we recently launched the World-Wide FINGERS Initiative. WW-FINGERS is an interdisciplinary network, to share experiences and data, and plan joint initiatives focusing on dementia prevention.

There is increasing evidence that it is possible to prevent or postpone late-life cognitive impairment and dementia with multi-domain lifestyle interventions. Tailored multimodal interventions combining non-pharmacological, nutritional and pharmacological approaches may be the most effective strategy to prevent cognitive impairment and dementia. WW-FINGERS will facilitate synergistic use of data from several countries, creating a unique opportunity for rapid implementation of knowledge and definition of effective and feasible prevention programs for diverse populations.

Recommendations for daily practice:

1. Healthy diet including plenty of fruits and vegetables, fish, unsaturated fats and whole grain products is beneficial also for the prevention of cognitive decline;
2. Dementia prevention is a lifelong journey, but it is possible to achieve benefits from lifestyle changes also in old age;
3. Targeting several risk factors at the same time, and tailoring interventions to take into account individual needs may be the optimal strategy;
4. What is good for the heart is also good for the brain.

S10 FOOD CONTAMINANTS: WHEN WE MIX SCIENCE AND POLITICS

Co-chairs: J. RAMSAY & J.M. LECERF

Organic vegetable products: from perceptions to scientific realities

M.J. AMIOT-CARLIN – INRA – FR

The organic sector is booming. This growth is affecting both supply and demand. It is reported that the consumption of organic products is closely associated with socio-economic, health and lifestyle indicators. Consumers have an increasingly negative perception of products derived from intensive production and industrialisation. The organic farming label offers consumers a guarantee of assurance that synthetic chemicals and GMOs have not been used in production. Organic products are thus preferred because of two salient features: the absence of crop protection products and the presence of substances with a positive influence on nutritional and sensory qualities. In general, organic and local are often undistinguishable for consumers, such that they would not buy organic products from remote sources.

What about the scientific reality? Organic regulations help produce products with specific qualities. On the health front, several articles, review and meta-analysis conclude that organic fruits, vegetables and cereals have fewer detectable pesticide residues than conventional products; no difference in mycotoxin concentrations has been reported between organic and conventional cereals. In terms of toxic metals, only cadmium concentrations have been found to be lower in organic cereals. Regarding nutritional quality, a recent meta-analysis showed that concentrations of various antioxidants are higher in organic plant products: this is true for polyphenols with +19 to +69% depending on the family (phenolic acids, flavanols, etc.), and for some carotenoids and vitamin C, but with smaller amplitudes, from +6 to +12%. For minerals, the differences are small; magnesium and zinc levels have been found to be slightly higher in organic vegetables. However, protein levels are lower in organic cereals (-15%). From a sensory point of view, most studies do not show significant differences between organic and conventional products. Some processing methods used in organic sectors such as the lesser degree of refining can have an impact on taste. Organic is considered a model food system in terms of sustainability. In fact, organic products have certain environmental benefits (reduced pollution and conservation of biodiversity) and social benefits (producer-consumer proximity via short supply chains). However, considering the accessibility for consumers, the prices of organic products are higher.

From a health point of view, rigorous studies comparing the effect of consumption of organic versus conventional products are non-existent. A French study in the Nutrinet-Santé cohort indicates that a higher consumption of organic foods, mainly vegetables, is associated with less metabolic syndrome risk, which is supposed to be due to less exposure to synthetic pesticides and/or endocrine disruptors. Studies are needed to validate this hypothesis.

As a recommendation, a diet with more organic or non-organic plant products provides protection against the risk of chronic disease incidence.

Endocrine disruptors: What are they and where do we go from here?

L. MULTIGNER – INSERM - FR

Chemical substances, both natural or man-made, having hormonal properties which may cause adverse health effects, were grouped under the generic term called Endocrine Disruptor. In the early 1990s, most attention was focused on substances having steroidal hormone properties and therefore on their undesirable effects (potential or confirmed) on reproductive system. Since then, new modes of action involving multiples biological signalling pathways, both endocrine or non-endocrine, have been identified. Considering that the various signalling pathways interact with one another, the potential undesirable effects might affect almost all systems and functions of an organism. Endocrine disruptors therefore cover a very wide field with imprecise borders and our understanding varies according to one's point of view. In addition, the science of Endocrine Disruption built around these substances currently deals between rigorous scientific approaches and over-simplistic interpretations. The result is an image that brings in mind Ansel Adams' words: "There is nothing worse than a sharp image of a fuzzy concept".

Environmental and health protection agencies have rightly seized upon substances that have potential health consequences. But to approach risk assessment and regulation, it is necessary to rely on an operational definition and not on a theoretical definition based on concepts, even if these concepts are widely accepted by the scientific community. The main challenge for an operational definition is that an endocrine disruptor should refer, as a starting point, to a mode of action and not to a health event. Faced with the many modes of action identified to date and to our lack of knowledge about their exact roles in the pathophysiological processes that may lead to an adverse health event, the operational definition of endocrine disruptors is far from obvious. In Europe, a definition has recently been proposed, encompassing several successive stages: i) that the substance has a hormonal mode of action, ii) that the exposure to this substance is associated with the occurrence of an undesirable health event, iii) that the adverse event may be explained by the hormonal mode of action mentioned. However, such a proposal based on the strict weight of evidence raises controversy. For a long time to come, it is to be feared that the issue of endocrine disruptors may still struggle between scientific evidence and misuse application of the precautionary principle by powerful interest groups.

Human health risk assessment on the consumption of F&V containing residual pesticides: a cancer risk/benefit perspective and non-cancer risk analysis

M. VALCKE – INSPQ – CA

Possible adverse health effects of pesticide residues in food are of concern for the population and public health authorities. Besides, abundant and varied consumption of fruit and vegetables (F&V) is a recognized preventive measure against some chronic health risks, including cardiovascular diseases and several types of cancer. Joint analysis of both issues is thus necessary for building sound public health policies. This study therefore aimed to evaluate the health risks and benefits associated with the chronic consumption of F&V in which residual pesticides can be measured, in the province of Quebec, Canada. Based on a representative sample of Quebecers ($n = 4727$, aged 1-79) enrolled in a Canadian nutrition survey, statistical distributions of their chronic dietary exposure to 169 different pesticide active ingredients (PAI) through the consumption of F&V was evaluated, including 135 for which non cancer toxicological reference values (TRV) were available in the literature. Among these, an oral cancer slope factor (SF) was also available for 28 PAI. Computing the ratio of the exposure estimates over each available TRV allowed generating ranges of PAI-specific non-cancer risk quotients (RQ) in toddlers (1-3 years), children (4-8 years), adults (19-50 years) as well as the entire population (1-79 years). Similarly, multiplying the entire population's mean chronic exposure value with the available SF allowed estimating the total cancer risk. The annual number of cancer cases estimated to be « prevented » was calculated for the province of Quebec based on the population's etiological fraction of the cancer risk that some F&V prevent its basal population risk, as well as the F&V consumption data. Non-cancer $RQ > 1$ were obtained at the 95th percentile of children's or toddler's exposure for 10 of the 135 PAIs, and considering the most severe pesticide-specific TRV. When the least severe TRV was considered, no $RQ > 1$ were obtained. Total lifetime cancer risk attributable to the sum of the 28 carcinogenic pesticide exposures was estimated to be 3.3×10^{-4} , which corresponds to 39 new cancer cases annually in the Province of Quebec. For each estimated case of cancer triggered by PAI exposure through residues present in F&V, at least 88 cases were deemed « prevented » by the consumed F&V. Non-cancer risk were not clearly affected by socioeconomical status nor by the number of daily portions of F&V consumed. 21 PAI were identified as of priority toxicological interest, with emphasis being put on dithiocarbamates and imazalil, the major contributors to cancer and non-cancer risk. Chronic non-cancer health risks investigated are low and anti-cancer health benefits of F&V consumption by far outweigh the corresponding PAI-related risk. However, some risk estimates are not negligible and uncertainties remain.

Such work contributes to orientate public health policies as well as recommendations for practitioners. Thus:

1. Reducing PAI usage, with a particular focus on priority PAI mentioned above;
2. Recommending an abundant and varied F&V diet;
3. Stressing out the importance of water washing them, is desirable.

This work warrants further studies addressing its uncertainties.



Why should we believe the evaluations of official bodies?

J. RAMSAY – EFSA - IT

The EU's General Food Law entered into force in 2002 marking a step change in the way food is regulated in the EU. Coming soon after a series of food safety scandals at the turn of the century, the most prominent of which was the BSE crisis, it created a system in which responsibility for risk assessment (science) and for risk management (policy) are kept separate. This model has proved to be resilient and has provided a strong basis for science-based policymaking and internal market and international trade. It has also ensured that the EU's 500 million citizens enjoy some of the highest food safety standards in the world.

Yet, the system is not unshakeable. Food fraud incidents such as the horsemeat scandal and the contamination of eggs with fipronil generated widespread public concern and led to questions being asked about whether national and European agencies were doing all they could to safeguard consumers from harm. Food safety agencies also regularly come under fire for their assessments of products submitted by industry for approval, such as pesticides, GMOs and food additives. Assessments that are perceived to conclude in favour of business can lead to allegations that an agency is "too close" to industry or that its experts have conflicts of interest. The most high-profile example of this in recent years is the ongoing debate over the safety of the pesticide active substance glyphosate, a controversy that continues to mobilise campaigners and non-governmental organisations, generate headlines in mainstream media, and hold the attention of politicians at a national and European level.

At the heart of this debate is the issue of trust. What levers and drivers affect the extent to which a food safety agency is trusted by its stakeholders? What explains why some food safety issues break through into mainstream political and media discourse while the vast majority of work carried out by agencies goes unnoticed and unchallenged? Is it really the case that trust in the official bodies responsible for food safety is on the decline, as some stakeholders would have us believe?

This presentation will explore these questions from the perspective of the European Food Safety Authority (EFSA), using the glyphosate controversy as a case study and making reference to recent research that EFSA has carried out on reputation. The presentation will argue that, while measures to improve trust can be made, the criticism levelled at EFSA is often unfounded and serves as a proxy for a wider societal debate about agriculture practices or the role that multinational organisations have in the food supply chain. In essence, the foundations of the food safety system in the EU remain strong.

DAY 3

D3

S11 CHANGING CONSUMPTION DUE TO FOOD SYSTEM CHANGE: THE ROLE OF MARKETING, BEHAVIOURAL NUTRITION AND SOCIAL INEQUALITIES

Co-chairs: J. HALFORD & J. BREDA (co-organized by N8 Agrifood)

Food systems and food choices

C. REYNOLDS – Sheffield University - UK

The global food system has become increasingly complex with many factors influencing food choices - why, how and what food is purchased and how, what and when food is consumed. Using the UK diet from the 1950s to 2016 as an example, this talk will introduce various themes within the current food system, and discuss how the UK food system evolved to become this complex.

Themes highlighted will include changes to farming, manufacturing, and the transport of food; as well as the evolution of shopping and eating habits. These themes will then be linked to their effects on food choice and health outcomes. Likewise, the demographic and lifestyle transformation over the last 65 years will be discussed.

Specific attention will be given to the fragmented and contrasted dietary patterns of the most rich and poor income groups. With examples provided of dietary advice and interventions that can be offered to promote healthy sustainable eating by harnessing the current food system and food choice trends.

Recommendations for daily practice:

1. The food system is something we all interact with every day – there is potential to change many different aspects of individual's food environments, food habits, and food practices;
2. Dietary changes are not a new phenomenon. However, we can now amplify the positive trends to produce positive health outcomes (What are the positive deviants doing?);
3. Diets have become fragmented by income group and demographics. New tailored messaging strategies are required to speak to an individual's diet and habits;
4. Ways of cooking and time use are changing, we must understand what people are doing (and aspiring to do) in order to shift food choices and produce positive health outcomes.

Household food insecurity and promotion of healthy nutrition

A. LINOS – Athens Medical School - GR

Results of the program DIATROFI, a humanitarian aid program addressing the results of the Greek crisis, are going to be presented. The program addresses food insecurity and promotes healthy nutrition among school aged children and their families, residing on the most underprivileged areas in Greece.

From spring 2012 to June 2018, over 120,000 children have benefited with 14 million meals distributed during early mornings every school day.

Food insecurity and dietary habits based on 160,000 questionnaires filled by parents of the benefited children indicate that food insecurity measured with the Food Security Survey Module (USDA) questionnaire ranged between 54% and 66% in the beginning of each school year and between 48% and 59% in the end of each school year. On average, the share of students not consuming fruits or milk decreased by 20%, whole wheat bread by 15% and vegetables by 10%; moreover the portion of students with low adherence to Mediterranean diet fell by more than 10%.

In addition to the descriptive data, results of 2 randomized trials examining the methodological approach to improving dietary habits will be presented. A number of schools were randomized for two consecutive years. In the first school year (2013-2014) comparison between meal distribution and combination of meal distribution and healthy nutrition promotion activities were conducted. Results showed that students receiving in addition to the meal, the healthy nutrition activities had 1.6 times higher probability to improve weight status from overweight/obese to normal and 2.5 times to improve weight status from underweight to normal. The probability to increase the consumption of milk/yoghurt or fruits was 1.2 times higher in the group receiving the healthy nutrition activities. In the second school year (2014-2015) healthy nutrition promotion activities were compared to the combination of meal distribution and healthy nutrition promotion activities. Students receiving in addition to the healthy nutrition activities, the meal, exhibited significantly larger decrease of household food insecurity (by approximately 10%) and this decrease was more evident for food insecure families (16%), underweight (20%) and overweight/obese children (12%).

To this end, combination of food aid with healthy nutrition promotion activities in school, seems the most effective pathway towards reducing food insecurity and improving the health and the dietary habits of students.

With: Petralias A, Zota D, Dalma A, Georgakopoulos P, Pantazopoulou A, Kouvari M, Drymoni P, Kastorini CM, Haviaris AM, Veloudaki A

Unhealthy food marketing techniques and food consumption impact

E. BOYLAND – University of Liverpool - UK

This talk will provide a brief overview of the literature showing that food marketing has a detrimental effect on dietary health by influencing both determinants of eating behaviour (e.g. attitudes, preferences) and actual eating behaviour (consumption). The effects of both traditional broadcast media and newer digital marketing techniques will be considered, acknowledging that far more is known of children's exposure to broadcast advertising and the power of that advertising to influence behaviour (e.g. the impact of TV advertising exposure on the amount of food consumed has been repeatedly and robustly demonstrated). New digital methods of marketing delivery are challenging for public health researchers, both in terms of measuring exposure and in empirically demonstrating impact. However, emerging data on digital marketing and its effects will be presented, highlighting some of the novel opportunities afforded to marketers by digital techniques.

There have been calls across Europe for stricter regulation of food marketing, particularly to young people, and this session will evaluate the strength of the evidence to underpin policy action in this area. The evidence to support a causal relationship between marketing exposure and weight gain in youth will be discussed.

Recommendations for daily practice:

1. Limit children's screen time and therefore limit advertising exposure.
2. Encourage young people to be critical viewers of marketing, teach them to consider the motives of the advertisers.
3. Try to minimise the influence of "pester power" on family food purchases.

Healthy promotion through digital techniques

F. FOLKVORD – Radboud University - NL

Systematic reviews and experimental studies have repeatedly shown that food promotion for energy-dense foods stimulates unhealthy eating behavior among children. Moreover, most food promotion techniques target automatic process and focus on the rewarding aspects of palatable food products, inducing snack intake subconsciously. Due to the effectiveness of these food promotion activities children consume too much energy-dense foods and not enough healthy foods, like fruits and vegetables, according international dietary standards. Eating a diet rich in fruit and vegetables is essential for growth and development, protects against many illnesses including cardiovascular disease, stroke, and cancer, and increases mental well-being. Numerous studies have consistently shown that dietary intake patterns of children are poor and do not meet (inter) national dietary standards, especially among young children from low socio-economic status. In contrast to fruit and vegetables, energy-dense snacks have intrinsically rewarding properties that make them "wanted" and "liked", thereby inducing unhealthy eating behavior.

Considering the effectiveness and success of food promotion of unhealthy foods, it is highly promising to examine *whether, how, and when*, food promotion for healthier foods might increase the intake among children. Different empirical studies have been conducted that tested the effect of healthy food promotion, but an overarching theoretical model that explains and predicts these effects is missing and needed. This presentation describes recent studies that have tested the effect of healthy food promotion on children's eating behavior and aims to present an integration of empirical findings in a new theoretical framework, the *Healthy Food Promotion Model* that increases the understanding of the effects of healthy food promotion on eating behavior that might also be used for future research in this area.

Recommendations:

1. One important recommendation in daily practice is to make healthy foods more available for youth, in order to make it the easiest choice whenever they are craving for snacks or have a moment to eat. An important marketing strategy of energy-dense foods is high availability;
2. Second, making the energy-dense snack option more difficult increases also the possibility that children will choose for the healthier option;
3. Third, if children are not intrinsically motivated to consume healthy foods, it might be an effective strategy to make it more appealing and increase extrinsic motivation to consume the healthier food. After having tasted the food repeatedly for extrinsic reasons, they might start to like the foods, and eventually choose more often the foods because of intrinsic motivation;
4. Fourth, try to focus on automatic processes when aiming to improve children's eating behavior, and not so much on education and improving knowledge, because they have been shown to have limited effects on improving dietary intake.

S12 HELPING SCHOOL CHILDREN EAT HEALTHILY: GPS AS A VITAL FORCE FOR EDUCATION AND IMPACT ASSESSMENT

Co-chairs: W. KALAMARZ & M. CAROLI

EU school scheme: a European tool to encourage good eating habits in children

G. MEDICO – EC-DG AGRI - BE

The scheme, funded through the European Union's common agricultural policy (CAP) with EUR 250 million per year, supports the distribution of fruit and vegetables and milk and milk products to schools across the EU as part of a wider programme of education about European agriculture and the benefits of healthy eating.

Previously operating as separate schemes for milk and for fruit and vegetables, the new combined scheme entered into force on 1 August 2017, ahead of the 2017-2018 school year. The reform aimed at simplification and enhanced effectiveness.

All EU countries participate in either or both parts of the scheme. Information on the number of participating children and schools is not yet available but the trend seems in line with the previous separate schemes that had proved successful*.

The distribution of fruit, vegetables, milk and milk products started in autumn 2017, accompanied by educational activities aimed at reconnecting children with agriculture and promoting healthy eating habits and by information and communication activities for the public.

The national authorities in charge of health and nutrition endorsed the list of fruit, vegetables, milk and milk products that children receive under the school scheme. Fruit and vegetables are available in 26 countries, with a clear priority for fresh products. As regards milk and dairy products, available in all countries, the trend is of healthier choices. Priority is for plain milk; fewer countries provide dairy products with limited quantities of added sugar and/or flavouring.

Many countries give priority to local purchasing, short supply chains and organic.

Authorities and stakeholders from the agriculture, health and education sector are associated to the planning and/o implementation of the school scheme.

**Around 12 million children participated in the school fruit and vegetables scheme and 18 million in the school milk scheme (data from the 2016/2017 school year).*

School food provision & EU School Scheme experience in Italy

S. **BERNI CANANI** – CREA Research Centre for Food and Nutrition - IT

In Italy the childhood overweight and obesity prevalence has reached 21,3% and 9,3% respectively in 2016 with large differences between regions and higher prevalence in the south of Italy (data from the Ministry of Health nutritional surveillance system “Okkio alla Salute”).

Children (8-9 years old) consume a too abundant mid-morning snack (53%), do not eat fruits and/or vegetables daily (20%) and have a daily consumption of sugary drinks or sodas (36%). These children have sedentary lifestyles and spend more than 2 hours a day playing with video games or watching TV (41%).

Moreover, the diffusion of social media is accompanied by a rampant disinformation, especially in the nutrition field. As reported by Eurobarometer (EBU Media intelligence Service «Trust in media 2017»), Italians refer to internet for health questions and trust in radio, tv, written press and internet. Unfortunately, it is not so easy to distinguish between scientific validated information and sensational fake news on the web.

The EU “School fruit and vegetables scheme” (SFVS), carried out in Italy since 2009, requires accompanying educational measures besides fruits and vegetables distribution for the mid-morning snack. The Italian Ministry of Agricultural, Food and Forestry Policies (coordinator of SFVS) assigns the measures to CREA, (Council for Agricultural Research and Economics), in particular to his Centre specialized in Food and Nutrition. The advantage of this approach is that the nutritional message dissemination can be scientifically accredited and univocal for the entire country.

Several actions were put in place, all of them with the aim of promoting fruit and vegetables consumption, involving students, families and teachers (e.g. teachers’ training).

The results obtained in the first year with the teachers training show the efficacy of the method, especially in improving children frequency of consumption of fruit and vegetables.

In fact, school is considered a target place to promote health and, when meals are provided by school canteens, the moment of lunch is also the occasion in which students can enrich their knowledge and curiosity towards the food, tasting new dishes and new flavours.

The Ministry of Health, in collaboration with many stakeholders, has drafted the Guidelines for school meals in order to standardize the indications at the national level to encourage, from childhood, the adoption of healthy and correct eating habits. These guidelines contain information on the organization and management of the catering service: roles and responsibilities, nutritional and intercultural aspects, criteria for defining the tender documents.

The possibility of attend the school canteen helps ensure full enjoyment of the right to education, to health and to non-discrimination, but their presence is not guaranteed in all the schools, again with regional differences and low prevalence in the south of Italy.



The strength of the measures adopted in Italy are:

1. Teachers personal engagement;
2. Integration with school daily activities, but “fun and exciting”;
3. Flexibility and adaptation to local context; particular attention in the involvement of the families;
4. Synergy with other Institutions (Ministry of Health and Ministry of Education).

The parents’ representatives: The unavoidable actors

V. DURIN – COFACE - FR

The parent suggests, the child decides.

If you confine yourself to the child you won’t be able to secure sustained improvement in their food choices because adults remain chiefly responsible for what’s provided. How can you get parents behind the project to change the food provided to their children and support what’s done in school?

Through the parent representative!

What is the parent representative and what is it for?

The parent representative is the link between what happens at school and the parent, but they also gauge areas for improvement and concerns. They seek to understand the school, support parents, inform and communicate. They can also collect feedback from parents and spearhead suggested changes to timetables but also the canteen provider; they gather queries for the headteacher, and support changes that may be worrying some people.

Parent representatives gather together in associations, with specific functions. The associations are partners of big institutional changes but always stand shoulder to shoulder with the child at the heart of the decision-making; nevertheless, they also defend the place of the parent, the primary educator. This is why they are a major player in any change within schools.

Recommendations on the ground:

1. Get in touch with the national or regional structure;
2. Contact the president of the school’s association;
3. Organise interaction with the association in advance, an evening meeting to understand and answer questions from all parents;
4. Closing: Afterwards, organise a wrap-up meeting involving the children, allowing parents to be present and local elected officials to be invited;
5. Dissemination: Use “black notebooks” as a guide to share your findings and good food practices but also to communicate what happens in class, because children don’t tell their parents much.

Joining up tools for optimal school food provision

S. STORCKSDIECK GENANNT BONSMANN – EC Joint Research Centre (JRC) - IT

Schools are a protected setting where children can learn and experience healthy dietary habits. It is positive to note that all countries in the EU have a more or less well developed school food policy in place – either established as mandatory standards or as voluntary guidance. Translating these policies into actual practice remains challenging at times, but a range of tools and measures are available that could be joined up for optimal school food provision and healthy eating habits of school children.

For example, the European Commission's Joint Research Centre (JRC) has developed technical guidance for the school setting on the public procurement of food for health. This guidance makes the case for health-minded food procurement that ensures school meals meet the nutrition standards defined in school food policies. Addressing the need for technical specifications that are clear and achieve the desired level of healthy school food provision, the report offers contract language phrasing built from real school food policy standards from across the EU. This information is complemented by hints on how to use procurement contract award criteria so that the most economically advantageous tender can be identified.

Furthermore, the JRC has produced a couple of toolkits that summarise the key components of successful interventions in schools to promote fruit, vegetable, and water intake. Typically such interventions combine multiple measures spanning the three areas of education, the environment, and the family, thus creating positive and engaging settings in which the healthy choice becomes the easy choice. For improving fruit & vegetable consumption, the analysis revealed that successful educational efforts covered aspects of classroom-based learning (e.g. dedicated lessons and homework, but also cross-curricular content), experiential learning (such as through school gardens and tasting sessions), games and competitions (incl. quizzes, song-writing competitions), and behaviour change approaches (role models, goal setting, individual feedback). As doctors are a trusted source of nutrition information, they can greatly support such educational efforts. Environmental components comprised increasing the availability of fruit & vegetables through various means, educating teachers and catering staff so as to be optimally supportive, and changes at the point of purchase or consumption (e.g. modifications to the display of foods to encourage positive behaviours). In this regard it is worth noting that Member States can enrol in the European Commission-funded school fruit, vegetable, and milk scheme. This scheme is designed to help promote the benefits of healthy eating to children and encourage them to increase their consumption of fruit, vegetables, and milk. Last, family involvement included organising parent evenings on healthy eating, encouraging food preparation together with children, and helping parents become good role models for regular fruit & vegetable consumption. Whatever the intervention eventually chosen, monitoring and evaluation are key to understanding which approaches work best in a given context; general practitioners are a vital force in assessing related health impacts.



Recommendations:

1. General Practitioners are a trusted source of information and should therefore be encouraged and enabled to deliver guidance on nutrition and health.
2. General Practitioners should be empowered and engaged in supporting education, monitoring, and evaluation as part of healthy diet and lifestyle interventions in schools and beyond.
3. Public procurement of food should consider health as a core aspect.
4. The JRC offers a range of useful tools and documents for promoting healthy eating in schools and invites anyone interested to consult the collection at <https://ec.europa.eu/jrc/en/news/helping-eu-schools-become-springboard-healthy-diet-and-lifestyle-habits>.

Round table

CONSIDERING THE ROLES OF KEY STAKEHOLDERS IN CHANGING F&V CONSUMPTION

Animated by: K. LOCK & P. JAMES

Panel:

A. Delahaye – European Parliament – FR
 M. Devaux – OECD – FR
 G. Golidis – EC – DG AGRI – BE
 W. Kalamarz – EC – DG SANTE – LU
 D. Sauvaitre – F&V Sector – FR
 A. Stavdal – WONCA Europe – NO

Introduction: Global benefits of F&V to health and sustainable development

K. LOCK – LSHTM - UK

This round table session will bring together experts from medical practice, economics, and food production with policy makers from the European Parliament, and European Commission (DG Sante, DG Agri) to discuss how to increase F&V consumption. It will consider how very different types of interventions - ranging from the work of doctors supporting individual patients to policies affecting the whole EU population - are all important parts of a whole system approach that is required to maximize the benefits of eating F&V for health, the environment, agriculture and the economy.

Questions for panelists

1. What is the evidence that fiscal policy levers increase consumption and production?
2. What can family and community doctors do to increase population consumption of F&V?
3. What are the challenges for current producers and all actors across the supply chain? What are the possible 'win-wins'?
4. How can the European Parliament become more effective in transforming the Commission's approach to the EU food chain in favour of fruit and vegetables? What has been achieved to harmonize different policies to better take into account the health benefits of F&V consumption?
5. Do European Commission investments maximize healthy diets while balancing the need to support profitable business? What is DG Sante doing to help counter the commercial influences on diet and promote F&V consumption?
6. What has been done in previous 5 years to increase F&V supply and ensure consumer prices are kept low? What are the challenges to European F&V policy in the next 5 years? How can current CAP policies be modified so that they favour F&V?