



TRansition paths to sUustainable
legume-based systems in Europe

agri KULTI

● **ESSRG**
Environmental
Social Science
Research Group

Book of abstracts

Legume consumers – Looking at legumes through the consumers' eye

2nd Continental Legume Innovation and Networking (LIN)

Workshop in Budapest, Hungary

Tuesday 11th September – Thursday 13th September



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List of contents

Poster abstracts	3
1) Public food procurement reform in Hungary: A true window of opportunity for pulses? (TRUE WP 7)	3
2) Grain legume research at NARIC Szeged	3
3) Legumes in schools.....	4
4) Environmental investigations and researches for enhance the low-input management practices in Diverfarming project.....	4
5) Crop diversification and environmental problems in the Danube-Tisza interfluvial region	5
7) The study of genetic reserves of common bean landraces at the CPD, Hungary.....	5
8) Genetic reserves of cowpea – Hungarian sandy hills – climate change: the study of an alternative legume.....	6
9) Vegetarian experiences and eating habits of self-defined ovo-lacto vegetarians, vegans, and omnivores.....	6
10) The value chain of legumes in Hungary- a qualitative analysis	7
11) The place of legumes in small scale agroecological production- experience from Szezon Kert	7
12) Soybean production in Italy.....	7
13) Making Legumes a Big Player in the Snack Market.....	8
14) Development of Protein-rich Food based on Extrusion (TRUE WP 3).....	8
15) An Index combining Environmental and Nutritional Aspects of Foods (TRUE WP 5)	9
16) The “Choose Beans” project (TRUE Case Study 19).....	10
17) Environmental footprint of rotations with and without legumes (TRUE WP 5)	10
18) Retailer-producer quality chains and innovations (TRUE Case Study 9)	10
19) Legumes in public and private food service (TRUE Case Study 11).....	10
21) Stakeholder perspectives on transition paths to legume-supported agri-food systems (TRUE WP 1)	10
22) General information about the TRUE project (TRUE WP 1).....	11
Presentation abstracts - SESSION 1	12
A) The value chain of legumes in Hungary AND The place of legumes in small scale agroecological production- experience from Szezon Kert.....	12
B) Applied research along the whole value chain: introduction of ÖMKi	12
C) The gene bank collections of legumes at the Center for Plant Diversity through the eyes of climate change.	12
D) Legumes in school catering.....	12
E) Grain legume research at NARIC Szeged	13
F) <Title>	13
G) Vegetarian experiences and eating habits of self-defined ovo-lacto vegetarians, vegans, and omnivores	14
Presentation abstracts - SESSION 2	15
a) Case study lentil farming: Farm structure and motivation of lentil farmers in Southwest Germany (TRUE Case Study 13).....	15
b) Make legumes great again - reviving a traditional food culture: Help us to create a cookbook based on European legumes` (TRUE WP 1)	15
c) The “Choose Beans” project (TRUE Case Study 19).....	15
d) Environmental footprint of rotations with and without legumes (TRUE WP 5).....	16
e) Regional legume situation in a globalised market with other alternative trends for (protein) food supply ...	16
f) Legumes and novel legume products (TRUE WP 3)	16
g) Experiences from the previous TRUE Mediterranean LIN Workshop (TRUE WP 1).....	17





Poster abstracts

1) Public food procurement reform in Hungary: A true window of opportunity for pulses? (TRUE WP 7)

Eszter Kelemen, Bálint Balázs, Diána Szakál:
ESSRG, Hungary

Public caterers provide food for over 1.1 million Hungarian people (more than 10% of the whole population) every day (Horváth 2016), therefore public food procurement has a critical role in making food consumption healthier and more sustainable. Recent reforms and bottom-up initiatives has been targeting such a sustainable shift from different angles, ranging from governmental regulations to gastronomy-led projects and NGO initiatives. A key argument for the changes is the high prevalence of obesity and nutrition related health problems within the Hungarian population (and among children), but other reasons (e.g. securing farmers' livelihood through localized food systems) are named, too. The poster will map some of the major initiatives – e.g. the 37/2014 Decree of the Ministry of Human Resources, the Mintamenza (Canteen Best Practice) Program, and the Menzaforradalom (Canteen Revolution) by Greenpeace –, and analyse whether they have created more space for pulses in public catering. Some hints about how the Hungarian society perceives the reforms are also shared, based on a media analysis. We found that ongoing reforms are trying to create a favourable environment for healthier public food procurement, although the approach is more control-oriented than empowering. Dried legumes are included now in the menus once in every two weeks, but meat products are considered as the major protein source. Bringing pulses to the forefront is still to come in Hungarian public catering.

2) Grain legume research at NARIC Szeged

Melinda Tar, István Kristó*
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The climate change and the one-sided crop rotation system which contain four main plants (wheat, maize, sunflower, rapeseed) without legumes make it necessary to develop new technologies - involving legumes - for integrated cropping systems. This could offer several benefits also for agro-ecosystem: valuable source of protein for food and animal feed, increased biodiversity, reduced nitrogen fertilizer application.

The main goals of our group are collection, preservation and maintenance of genetic reserves of grain legumes (field pea, chickpea, faba bean and grass pea), the morphological description and agronomic testing of sources. During our work we select highly adaptable varieties with special quality for small take holders and also for bigger farms. The use of molecular markers to characterize each breeding line enable us to identify their genetic background of quality and resistance properties. The measurement of protein and vitamin content of the breeding materials is achieved by means of various analytical methods.





3) Legumes in schools

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In accordance with the European trend, more and more children have their meals in the canteen, so all the questions of nutrition biology related to school catering have come into the limelight. Legumes are well represented in Hungarian school catering since regulations oblige the caterers to serve legume at least once in a ten schooldays period. Green pea, French bean, kidney bean, lens and yellow pea are the served regularly in various form. However the regulations are moderately suitable to determine the real consumption, because pupils can reject or consume partly the served food. Therefore limited information is available about the real quantity of consumed food and leftovers in schools.

In 2017 a food preference survey was conducted in more than 80 Hungarian secondary schools. In this research, plate waste of the canteens was analyzed according to the main ingredients. By analyzing the served portions and the amount of plate waste, we estimated the real quantities of the consumed food. This research will focus on dishes with legume ingredients. Legume dishes was served in 26 schools for altogether 2 329 person (pupils and teachers) during the survey period. About 726 kg legume containing food were served, 474 kg were consumed and 252 kg became food waste.

4) Environmental investigations and researches for enhance the low-input management practices in Diverfarming project

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This poster presents the scientific investigations of asparagus crop at Jakabszállás and vineyard in Villány as case study areas of H2020 Diverfarming* project, Hungary. The case study No. 10 experimental plot of 1.3 ha with 28 rows of asparagus located at Jakabszállás – Danube -Tisza Interfluve (Hungary). The case study No. 11 located in Villány, on loess-covered area the southern slope of Fekete-hill. Among the managing practices (cs10) are the foil coverage, crop rotation, mineral fertilizer and integrated pest management. The main environmental problems at Jakabszállás are wind erosion and drought hazard, lack of ground cover, poor soil quality, low soil organic matter content and water scarcity. At vineyard area, where organic farming method was introduced, loss of biodiversity, tractor-wheel erosion, soil compaction. In the period 2018-21 the experimental management practices focus on the crop diversification, low-input land use such as intercrop in lines (*Achillea millefolium*), OM sequestration methods, etc.

*Crop diversification and low-input farming across Europe: from practitioners' engagement and ecosystems services to increased revenues and value chain organisation





5) Crop diversification and environmental problems in the Danube-Tisza interfluve region

Marietta Rezsek, József Dezső, Dénes Lóczy

Doctoral School of Earth Sciences of the University of Pécs, 7624 Pécs, Ifjúság street 6.

The research is focused on environmental problems and low input practices in sandy and loess-covered areas of the Pannonian pedoclimatic region within the framework of the H2020 Diverfarming project. This poster presents the investigations of asparagus crop at Jakabszállás, Hungary, with wind erosion and drought hazard. The experimental plot of 1.3 ha with 28 rows of asparagus located at Jakabszállás – Danube -Tisza Interfluve (Hungary). Currently 7–10 years of monocropping system is used for food production. Among the managing practices are the foil coverage, crop rotation, mineral fertilizer and integrated pest management. The main environmental problems which occur in this plot are the loss of biodiversity, wind erosion, lack of ground cover, poor soil quality, low soil organic matter content and water scarcity.

For diversification: we propose two alternatives:

D1: interrows cropped with field pea (for improving nitrogen balance);

D2: interrows cropped with oat for organic material enhancement and/or marketable produce

Link for further information: <http://www.diverfarming.eu/images/casestudy/CS10.pdf>

6) The use of field pea intercropping

Dénes Lóczy, Marietta Rezsek, József Dezső

Doctoral School of Earth Sciences of the University of Pécs, 7624 Pécs, Ifjúság street 6.

The poster will present the use of field pea intercropping within the Diverfarming H2020 project-

7) The study of genetic reserves of common bean landraces at the CPD, Hungary

L. Horváth, B. Horváth, G. Málnási Csizmadia, O. Szalkovszki

Center for Plant Diversity, Tápiószéle

The main goal of the research is to analyze the genetic reserves of domestic common bean (*Phaseolus vulgaris* L.) landraces to aid sustainable plant breeding and to ensure the conditions of healthy diet. The gene bank collection of common bean at the Center for Plant Diversity is made up of 4416 accessions. Of these, 3096 are landraces, with 2500 originating from Hungary and 596 coming from neighbouring countries. The present study gives details about the results of the examination of 669 randomly selected landraces that were handpicked from the reservers mentioned above. Their collection began in the 50's and peaked in the 80's with 225 landraces gathered around that time.

The main tasks in this initial part of the project were the biological and morphological description of the landraces, the evaluation of Rhizobium contamination and the multiplication of basic seed samples for the upcoming experiments.

This study is funded by the National Research, Development and Innovation Office as part of the SNN 120191 Project.





8) Genetic reserves of cowpea – Hungarian sandy hills – climate change: the study of an alternative legume

B. Horváth, L. Horváth, O. Szalkovszki
Center for Plant Diversity, Tápíószele

Climate change is compelling us to increase the productivity in our cultivation of field crops. This results in the necessary emergence of new cultivars, and even new species, that are more adaptable to the changed conditions. Cowpea, a globally distributed legume in the *Vigna* genus with extensive information on its drought resistance, has the potential to achieve this, even in our country. The preliminary goal of the experiments set up in 2016 and 2017 was to compare the yield of 29 cowpea accessions in dry farming conditions. The soil that was used is sand that is typical to the Hungarian Sandy Hills. Yield comparison of the accessions revealed the difference in output (in both years) as well as the protein content and Rhizobium occurrence.

9) Vegetarian experiences and eating habits of self-defined ovo-lacto vegetarians, vegans, and omnivores

Andrea Papp^{1,3}, Norbert Magyar², Andrea Lugasi¹

1 Budapest Business School, Faculty of Commerce, Catering and Tourism, Department of Hospitality

2 Budapest Business School, Faculty of Commerce, Catering and Tourism, Department of Methodology

3 University of Debrecen, Doctoral School of Food and Nutrition

The problem of global climate change and the increasing environmental impact brought about new scientific disciplines interested not only in the nutritional impact of diets, but their environmental impact as well. Plant-based diets are in the focus of sustainable nutrition researches, due to their advantages in resource management and environmental impact. These diets contain less (or zero) animal-based products compared to average diet, and either way they tend to be rich in fresh or minimally processed plant-based ingredients. Vegetarian diets are plant-based diets that contain no meat or even no animal-based products at all.

Well-planned vegetarian diets are confirmed to be healthy by many nutritional and dietetic organisations worldwide, however, there is still no resolution in Hungary. As there seems to be an increasing tendency in the interest toward vegetarian diets, the health care system, the food industry, and the catering sector must adapt. However, there is a lack of research about the Hungarian vegetarian population. Our investigation focuses on the lifestyle and eating habits of Hungarian self-defined ovo-lacto vegetarians and vegans.

We compare nutritional and environmental traits of diets among self-defined ovo-lacto vegetarian and vegan women with similarly health-conscious omnivore ones. In the first phase, we made a descriptive cross-sectional analysis with online questionnaire. We were interested in lifestyle, motivation, self-defined health state, eating habits, and food frequencies.

Vegetarian groups judged their actual health state to be better than omnivores, and they felt their health improving after going vegetarian. Although a big part of them reported unpleasant symptoms during the transition period. Many omnivores have tried some vegetarian diets, but they abandoned it for various reasons. As we expected, the consuming frequency of pulses, soy products, mushrooms, nuts and seeds were higher compared to omnivores. Vegans tend to cook for themselves the most and they visit the least catering units. Among omnivores, the assumption that a vegetarian meal is especially healthy seems to be the strongest motivation to choose such meals





in catering units, while these being cheaper than the non-vegetarian ones was the weakest motivational factor.

This research was supported by The Center of Excellence in Sustainable Catering – BGE.

10) The value chain of legumes in Hungary- a qualitative analysis

Katalin Rethy, agroecologist/ vegetable farmer

Szezon Kert

A qualitative analysis of the Hungarian legume sector was conducted with the participation of 17 stakeholders in the field. The goal was to gain oversight on the value chain; specifically on the barriers and opportunities present in the sector; on the long term also aiming to strengthen cooperation among members of the value chain. Interviewees were selected from a wide variety of fields, such as research, policy, plant breeding, production, communal catering and retail. Results show that Hungarian climatic and soil conditions make it possible for a wide variety of legumes to be grown both for human and animal consumption. A good selection of locally adapted varieties and the knowledge for production is present in specialized research institutes for developing production, processing and consumptions of legumes in Hungary. However, currently the sector is not living up to its potential; and in some fields it is even degrading.

11) The place of legumes in small scale agroecological production- experience from Szezon Kert

Katalin Rethy, agroecologist/ vegetable farmer

Szezon Kert

Consumer perception of legume products is often based on negative stereotypes concerning digestibility, preparation time and lack of variety in recipes and use. Leguminous plants play an important role in all scales of organic production, therefore it is necessary to develop consumption and degrade those negative stereotypes- starting with offering a wide variety of legume types, products and showing ways of varied uses. The role of leguminous plants in a small scale agroecological vegetable production, alternative fresh products and consumer education will be presented with examples from Szezon Kert.

12) Soybean production in Italy

Tiziana Centofanti

Central European University

Italy is the first producer of soybean in Europe. The reason for the high production of soybean is analysed in the context of relevant European and national policies that may favour soybean cultivation over other crops. Climatic and ecological conditions, as well as agronomic know-how, are other factors that are considered in the analysis. The history of soybean production in Italy reveals that Italy has been at the forefront of non-GMO soybean production since 1980. Today this trend is being supported and facilitated by the demand for high-quality GMO-free products (i.e., meat, dairy, etc.).





13) Making Legumes a Big Player in the Snack Market

Simon Vogt & Emilie Wegner

Hülsenreich

Hülsenreich is a young food start-up looking to bring snacks made out of legumes to the German market. By offering legumes in modern and sought-after forms of consumption, Hülsenreich seeks to establish a healthy and sustainable alternative to conventional snacks and make legumes in general play a bigger role in consumers' choices.

From a consumer perspective sustainability is often a topic that is associated with an unpleasant change of lifestyle. With legumes provided as protein-rich snacks full of dietary fibre we give the consumer the opportunity to combine sustainability with indulgence and at the same time personal health, a topic far more graspable to most people.

Legumes are known to most people only as a part of traditional dishes. As these traditional dishes are in decline in the modern world, we are aiming to help legumes survive the transition towards today's consumers' demands. Legumes being very nutritious makes them a perfect candidate for snack products that can also be seen and eaten as a small meal on the go, which has been an increasingly demanded form of consumption in recent years.

Starting with tortilla chips and accompanying dips, all based on legumes, the plan is to later move on to a wider array of legume-based products, both savory and sweet. This way we are looking to establish and normalise legumes in the consumers' eye as a solid part of the everyday modern diet instead of just a once-in-a-while ingredient in cooked meals.

14) Development of Protein-rich Food based on Extrusion (TRUE WP 3)

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IGV Institute for Cereal Processing GmbH, Arthur-Scheunert-Allee 40/41, 14558 Nuthetal - Germany

In recent years, the nutritional trends have changed worldwide. The increase in meat consumption per capita in developing countries and a new trend in reducing meat consumption in industrialized countries have led to an increase in demand for plant-derived proteins and derived foods.

Reduced meat consumption needs to be replaced by a high-protein diet based on plant proteins, resulting in a growing market for new products. The best-known type is soybean, but the allergenic potential as well as the fear that GMO soy products could be imported are unsettling many European consumers. Therefore, a new search for other regionally produced legumes is emerging.

IGV GmbH has several years of experience in the processing of protein-rich vegetal foods. For several years we have been working on the characterization of the processing properties of legumes and the development of new products. The aim of the development work are products which are delicious, healthy, free from allergens, gluten, GMO and rich in protein and fibre. The resources are Flours, Protein-Isolates, Protein-Concentrates of Green Peas, Yellow Peas, Fava Beans, Lentils. The main technologies we work with are extrusion, pasta making and baking. Products are for example high-protein pasta, peas flakes, crispies for the production of meat balls and muesli or nuggets and balls as snacks

Keywords: Legumes, Protein, Extrusion, Pasta, Meat Analog, Snacks





15) An Index combining Environmental and Nutritional Aspects of Foods (TRUE WP 5)

Dr. Michael Williams, Sophie Saget, Sabhdh Sheeran
Trinity College Dublin

Sustainably intensifying food production and implementing healthy diets are two major global challenges to tackle agricultural dependence on resources, soil degradation, greenhouse gas emissions, nutrient pollution and inefficiency, and the spread of unhealthy diets which are linked to type 2 diabetes, coronary heart problems and colon cancer (Huxley et al, 2009; Norat et al, 2005). It has been shown that increasing legume production and consumption provides a solution to both these issues (Foyer et al, 2016). Consumers are increasingly aware of the role of nutrition in health and are seeking direction to adopt a healthy diet, and popularities of different diets vary among the globe (Nielsen, 2015). Currently, there is no effective index that combines environmental and nutritional aspects of food products.

This research linked environmental impacts with nutrition to advise consumers and policy makers to develop optimal diets. An extensive database of foods that combines nutrition with global impacts through the Nutrient Rich Foods (NRF) index (Drenowski et al., 2005; 2009; Drenowski, 2010) and Global Warming Potential (GWP), and local impacts through NRF and Eutrophication Potential (EP), was developed. NRF is an index that integrates nutrient contents to encourage and limit of food items as a proportion of a person's daily recommended intake. GWP indicates the amount of heat a greenhouse gas is trapped into the atmosphere, while EP expresses the excessive enrichment of water.

We performed a meta-analysis of food Life Cycle Assessments (LCAs) at farm gate and compared it with Poore and Nemecek's meta-analysis (2018) of the same foods at store gate. A database with NRF9.3 and NRF11.3 of these foods was subsequently built and combined with the environmental indices to form the "Nutrient Richness Environmental Impact index" (NREI). We found that there is a large variation of environmental impacts between farm and store gates, implying that post-production stage plays an important role on impacting the environment. Animal products showed the lowest score in the NREI, while legumes scored the highest.

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360(6392), pp.987-992.

16) The “Choose Beans” project (TRUE Case Study 19)

Elisete Varandas

Eurest Portugal

The “Choose Beans” project began as an internship work and came to prove to be an important consumer communication tool, promoting food education and promoting healthy and environmentally friendly choices.

It is importante to keep looking for alternatives that appeal to the consumer and motivate them to make healthier choices, innovation is key to meeting expectations if we want to make legumes an alternative. Strengthening of this path are some of our recente national policies that have been created with these same gols.

Despite some limitations the evolution in the consumption of legumes as a TRUE alternative, is quite positive being the involvement of Eurest and the other partners essential part to success. That's why we “Choose beans”.

17) Environmental footprint of rotations with and without legumes (TRUE WP 5)

David Styles, Marcela Porto Costa

Bangor University, UK

Our analysis will evaluate the environmental footprint comparing how the legumes perform in rotations compared with based line rotation, considering the whole value chain. (raw materials, production, processing, consumption by humans and by livestock).

We will assess the benefits of introducing more legumes on human and animal diet.

18) Retailer-producer quality chains and innovations (TRUE Case Study 9)

Karen Hamann

IFAU, DK

19) Legumes in public and private food service (TRUE Case Study 11)

Karen Hamann

IFAU, DK

20) Situation of Legumes in Croatia (TRUE Case Study 16)

Jurka Topol

REDEA, Croatia

21) Stakeholder perspectives on transition paths to legume-supported agri-food systems (TRUE WP 1)

Pietro Iannetta

James Hutton Institute, UK





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22) General information about the TRUE project (TRUE WP 1)

Henrik Maaß

Research Centre for Global Food Security and Ecosystems, University of Hohenheim, Germany





Presentation abstracts - SESSION 1

A) The value chain of legumes in Hungary AND The place of legumes in small scale agroecological production- experience from Szezon Kert

Katalin Rethy, agroecologist/ vegetable farmer
Szezon Kert

See abstracts above on page 7

B) Applied research along the whole value chain: introduction of ÖMKi

Orsolya Papp

Hungarian Research Institute of Organic Agriculture (ÖMKi), www.biokutatas.hu

The Hungarian Research Institute of Organic Agriculture (ÖMKi) was founded in 2011, aiming to foster scientific research of organic agriculture in Hungary. In 2012, the on-farm participatory research network was launched. On-farm participatory research means close cooperation with farmers: simple experiments are fit into the farms' everyday practice. ÖMKi researchers and farmers work together in defining the practice-oriented research questions and in collecting and evaluating the data. Yearly more than 120 farms take part voluntarily in the on-farm network countrywide. When defining the research subject, it is important to include the whole value chain, since the feedback from consumers and other stakeholders can heavily affect the research goals and even the end product.

Enriching agrobiodiversity, improving organic production systems and organic product development are of key importance in our activities. We have different research topics in organic viticulture, apiculture, horticulture and arable cropping. Because of our multi-actor approach, ÖMKi is partner in several Horizon 2020 European projects as well.

C) The gene bank collections of legumes at the Center for Plant Diversity through the eyes of climate change

Lajos Horváth

CPD, Tápíószele

The presentation sums up the experiences, gained during gene bank multiplications, that might help in the direct use of genetic reserves of legumes. Based on the observations that are related to the issues of climate change management, yield security, and the options of utilization in ecological farming, 14 legume species are to be described in the presentation. Finally, we conclude, that the gene bank is aware of the species- and cultivar-related reactions given to these issues, and that the genetic reserves can be utilized as a backup for the use and breeding of cultivars, which is necessary for the preferred corrections.

D) Legumes in school catering

András Bittsánszky¹ – András Tóth^{1,2} – Csaba B. Illés²





¹InDeRe Institute for Food System Research and Innovation Nonprofit Ltd, Fehérvári út. 132-144, 1116 Budapest, Hungary. ²Szent István University, Department of Business Economics and Management, Páter Károly u. 1, 2100 Gödöllő, Hungary

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In 2017 a food preference survey was conducted in more than 80 Hungarian secondary schools. In this research, plate waste of the canteens was analyzed according to the main ingredients. By analyzing the served portions and the amount of plate waste, we estimated the real quantities of the consumed food. This presentation will be focus on dishes with legume ingredients. Legume dishes has been served in 26 schools for altogether 2 329 person (pupils and teachers) during the survey period. The data analysis showed the preference of legumes in school catering compared to other dishes. The total plate waste of legume containing dishes was about 30% of the total served food.

E) Grain legume research at NARIC Szeged

Melinda Tar*, István Kristó

National Agricultural Research and Innovation Center, Department of Field Crops Research
Alsókikötő sor 9. Szeged, 6726-Hungary. *tar.melinda@noko.naik.hu

The climate change and the one-sided crop rotation system which contain four main plants (wheat, maize, sunflower, rapeseed) without legumes make it necessary to develop new technologies - involving legumes - for integrated cropping systems. This could offer several benefits also for agro-ecosystem: valuable source of protein for food and animal feed, increased biodiversity, reduced nitrogen fertilizer application.

The main goals of our group are collection, preservation and maintenance of genetic reserves of grain legumes (field pea, chickpea, faba bean and grass pea), the morphological description and agronomic testing of sources. During our work we select highly adaptable varieties with special quality for small take holders and also for bigger farms. The use of molecular markers to characterize each breeding line enable us to identify their genetic background of quality and resistance properties. The measurement of protein and vitamin content of the breeding materials is achieved by means of various analytical methods.

F) <Title>

Ruprecht László, President

Stílusos Vidéki Éttermiség (SVÉT), Hungary





G) Vegetarian experiences and eating habits of self-defined ovo-lacto vegetarians, vegans, and omnivores

Andrea Papp; Assistant Research Fellow, PhD student³, Norbert Magyar; Senior Lecturer², Andrea Lugasi; Head of Department¹

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²Department of Methodology, Faculty of Commerce, Catering and Tourism, Budapest Business School

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The problem of global climate change and the increasing environmental impact brought about new scientific disciplines interested not only in the nutritional impact of diets, but their environmental impact as well. Plant-based diets are in the focus of sustainable nutrition researches, due to their advantages in resource management and environmental impact. These diets contain less (or zero) animal-based products compared to average diet, and either way they tend to be rich in fresh or minimally processed plant-based ingredients. Vegetarian diets are plant-based diets that contain no meat or even no animal-based products at all.

Well-planned vegetarian diets are confirmed to be healthy by many nutritional and dietetic organisations worldwide, however, there is still no resolution in Hungary. As there seems to be an increasing tendency in the interest toward vegetarian diets, the health care system, the food industry, and the catering sector must adapt. However, there is a lack of research about the Hungarian vegetarian population. Our investigation focuses on the lifestyle and eating habits of Hungarian self-defined ovo-lacto vegetarians and vegans.

We compare nutritional and environmental traits of diets among self-defined ovo-lacto vegetarian and vegan women with similarly health-conscious omnivore ones. In the first phase, we made a descriptive cross-sectional analysis with online questionnaire. We were interested in lifestyle, motivation, self-defined health state, eating habits, and food frequencies.

Vegetarian groups judged their actual health state to be better than omnivores, and they felt their health improving after going vegetarian. Although a big part of them reported unpleasant symptoms during the transition period. Many omnivores have tried some vegetarian diets, but they abandoned it for various reasons. In alignment with our expectations, seitan, soy and pulses displayed the closest correlation with diet itself, regarding the consumption frequency of the foods. Among omnivores, the assumption that a vegetarian meal is especially healthy seems to be the strongest motivation to choose such meals in catering units, while these being cheaper than the non-vegetarian ones was the weakest motivational factor.

This research was supported by The Center of Excellence in Sustainable Catering – BGE.

H) <Title> (TRUE Case Study 17)

Bertényi Gábor, Králl Attila

AgriKulti, Hungary





Presentation abstracts - SESSION 2

a) Case study lentil farming: Farm structure and motivation of lentil farmers in Southwest Germany (TRUE Case Study 13)

Schmidt-Cotta, V.¹, Rieps, A.-M.^{1,2}, Zikeli, S.^{1,2} & Gruber, S.¹

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Local lentil production has had a successful revival in Southwest Germany in the past ten years. A survey has been conducted to identify the key factors for this success. Farmers answered questions concerning agronomical aspects and individual motives for lentil cultivation. Access to processing facilities for separation of the lentil and companion crop is essential to start lentil cultivation. The positive impact of lentils on biodiversity and the high publicity the crop receives are additional important drivers for both, organic and conventional farmers to start lentil cultivation.

b) Make legumes great again - reviving a traditional food culture: Help us to create a cookbook based on European legumes` (TRUE WP 1)

Claudia Nathansohn

Slow Food Deutschland e. V.

Slow Food is a global movement committed to making our food system more sustainable and thus fit for the future. Slow Food promotes good, clean and fair food which is produced in a way that does not harm people, animals and the environment. Slow Food involves over a million activists, chefs, experts, youth, farmers, fishers and academics in over 170 countries. Slow Food members are contributing through their membership fee, as well as the events and campaigns they organize. Slow Food Germany is one of 24 project partners from practice and science involved in the EU project TRUE.

Slow Food's task within the project is to create a cookbook containing legume recipes from various European regions. These are complemented by historical background information on the used legumes and the dishes and supplemented by project partners with ecological footprints and nutritional information. The book is to be published by mid-2021 and will then be distributed throughout Europe.

c) The “Choose Beans” project (TRUE Case Study 19)

Elisete Varandas

Eurest Portugal

See poster abstract on page 10





d) Environmental footprint of rotations with and without legumes (TRUE WP 5)

David Styles, Marcela Porto Costa
Bangor University, UK

See poster abstract on page 9

e) Regional legume situation in a globalised market with other alternative trends for (protein) food supply (TRUE WP3)

János-István Petrusán^{1*}, Uwe Lehrack¹, Gerd Huschek¹, Martha Walter¹

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There are several studies analysing different, individual protein sources for nutrition from diverse plants, groups of plants or even alternative, so-called emerging protein sources. The presentation is dealing with the economic facts and trends observed within the legume supply chain as an emerging palette of the protein source. The entire problematic is presented, starting with protein sources, followed by market situation and future trend analysis, and including nutritional quality comparison of different proteins derived from diverse resources. We have tried to highlight the current evidence related to protein-rich vegetal and non-vegetal sources and the pathways of their valorisation in the view of consumer demands, as well as to highlight trends in protein food security and consumption for the next decades.

We are providing also the audience with a briefing of a “case study”, that of IGV pea-based product marketing strategy. This strategy shows that legumes may have a bright renaissance, when they are complemented with other vegetal sources (i.e. microalgae for vegan consumers).

Keywords: legumes, protein source, alternative protein, population, consumption, trends, nutritional value, markets, technology, novel protein sources.

f) Legumes and novel legume products (TRUE WP 3)

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Legume grains are plant foods that have been present in traditional diets across the globe for centuries, and their importance as ingredients in processed food products has increased exponentially in recent years. The health benefits of legume grains stimulated the United Nations Food and Agriculture Organization (FAO) to nominate 2016 as the ‘International Year of Pulses’ under the slogan ‘nutritious seeds for a sustainable future’. This recognition stems from the fact that legume grains are environmentally beneficial, and nutritionally rich in protein, fibre, vitamins, phytochemicals and essential minerals. Moreover, their natural diversity in terms of color, shape, taste, nutritional composition and processing characteristics offers a great potential in developing novel legume products that may be targeted to different types of consumer and population segments. In fact, as the demand for foods based on plant protein is growing 6-7% annually, and most of the plant proteins are consumed in a processed form, there is a strong role for legumes in





fulfilling this role. Here we will discuss the importance of a proper germplasm evaluation of grain cooking and processing characteristics, as well as the applications of legumes in high value food niches (such as in specialized nutrition, or as meat replacers) and keeping in mind the role of legumes as a food commodity per se. This dual utilization of legume grains is necessary and must be embraced when aiming at increasing legume consumption and acceptability. We will also demonstrate how legumes can be successfully incorporated in demitarian, sustainable diets, providing potential health benefits, and increasing their acceptability. Finally, we will showcase some of the developments in terms of legume product development for food applications within the scope of the TRUE project, but also by other players in the global food sector. We hope that this talk will provide a summarized insight on the role that common beans, chickpeas, lupins, lentils or even soybeans may play, in helping the EU reduce the amount of animal protein intake, and in the future, contribute to more sustainable and healthy food systems.

g) Experiences from the previous TRUE Mediterranean LIN Workshop (TRUE WP 1)

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h) Experiences from the previous TRUE Atlantic LIN Workshop (TRUE WP 1)

Karen Hamann

IFAU, Denmark

i) Experiences from the previous TRUE Continental LIN Workshop (TRUE WP 1)

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