



Fifth and Final DairyCare Conference
Thessaloniki, Greece
19th and 20th March, 2018



SCIENTIFIC PROGRAMME

Outline Programme for the Fifth and Final DairyCare Conference, Thessaloniki

Monday 19th March

0830:1400	Registration
0900	Welcome and Introductory Remarks
0920	Scientific Session 1: Abstracts related to WG1, Biomarkers
1050	Coffee and Posters
1115	Scientific Session 1 continued
1135	Current Project Awareness Session (nine invited speakers from ongoing and planned EU and national projects)
1235	Scientific Session 2: Abstracts related to WG2, Activity
1325	Lunch and Posters
1420	Plenary Review of DairyCare's Biomarker Research Achievements and Future Prospects <i>(Ali Mobasher, Surrey and Andre Almeida, Lisbon)</i>
1450	Scientific Session: Cow and Calf Together Incubator Group
1555	Scientific Session: Validation Protocols Incubator Group
1625	Coffee, Tea and Posters
1650	Plenary Review of DairyCare's Systems Research Achievements and Future Prospects <i>(Tomas Norton, KU Leuven)</i>
1730	Management Committee Meeting
1900	Social Programme: Tour of Thessaloniki and Dinner

Tuesday 20th March	
0830	Reflections on DairyCare <i>(Chris Knight, UK)</i>
0850	How research contributes to EU policy on animal welfare <i>(Denis Simonin, Head of Animal Welfare Sector at EU Commission)</i>
0920	Scientific Session 3: Abstracts related to WG3, Systems
1030	Coffee and Posters
1050	Scientific Session: Small Ruminant Sensors Incubator Group
1135	Plenary Review of DairyCare's Biomarker Research Achievements and Future Prospects <i>(Marie Haskell, UK)</i>
1200	Planning for Future Project Opportunities Open discussion session
1300	Lunch and Posters
1400	Invited Plenary: Welfare related research and funding opportunities in the USA <i>(Joao HC Costa, USA)</i>
1415	Invited Plenary: Technology use in the Australian dairy industry and its value to the health and productivity of the individual dairy cow <i>(Cameron Clark, Australia)</i>
1445	Plenary Review: Progress and prospects in optimized dairy husbandry <i>(Jude Capper, UK)</i>
1530	DairyCare Blueprint for Action and Dissemination
1600	Coffee, Tea and Breakout Groups
1645	DairyCare Blueprint for Action and Dissemination
1730	Close of Conference
1930	Social Programme: Conference Dinner

Draft Programme for the Fifth and Final DairyCare Conference, Thessaloniki

Monday 19th March

0800	Registration	
0900	Welcome and Introductory Remarks: <i>(Chris Knight, UK, Evangelia Sossidou and Thomas Bartzanas, Greece)</i>	
Scientific Session 1: Abstracts related to WG1, BioMarkers		
0920	1	Milk biomarkers to evaluate health status of mammary gland in high producing dairy cattle Cinzia Marchitelli, Federica Signorelli, Francesco Napolitano, Clément Grelet, Nicolas Gengler, Frédéric Dehareng, Hélène Soyeurt, Klaus Lønne Ingvarstsen, Martin Tang Sørensen, Torben Larsen, Mark Crowe & GplusE consortium cinzia.marchitelli@crea.gov.it
0930	2	Milk haptoglobin as an indicator of udder health in heifers after calving Patrícia Simões, Mairead Campbell, Lorenzo Viora, James Gibbons, Timothy Geraghty, P David Eckersall & Ruth Zadoks patriciasimoes@fmv.ulisboa.pt
0940	3	Haptoglobin: A biomarker for selective dry cow therapy Emily L. O'Reilly, Lorenzo Viora, Nicola Brady, Patricia Simoes, Ruth Zadoks & P. David Eckersall emily.oreilly@ed.ac.uk
0950	4	Mid-infrared based biomarkers in milk as a non-invasive tool for early prediction of lameness caused by metabolic disorders Axelle Mineur, Astrid Köck, Clément Grelet, Nicolas Gengler, Christa Egger-Danner & Johann Sölkner axelle.mineur@uliege.be
1000	5	The effects of an ACTH challenge test on lame and non-lame dairy cows Viktor Jurkovich, Enikő Laky, Levente Kovács, Andrea Bende, Ferenc Ruff, Luca Kézér & Mikolt Bakony jurkovich.viktor@univet.hu
1010	6	Random forests prediction of blood metabolic clusters of dairy cows: comparing 3 types of milk biomarkers Leslie Foldager, Miel Hostens, Mazdak Salavati, Clément Grelet, Martin Tang Sørensen, Mark Crowe, Klaus Lønne Ingvarstsen & Genotype Plus Environment Consortium leslie@anis.au.dk
1020	7	A Generalized Linear Mixed Regression Model of BHB to Early Detection of Nutritional and Management Problems in Dairy Herds Cristina Conceição P, Inês Domingues, Pedro Vaz, Rui Moreira & Paulo Infante ccp@uevora.pt
1030	8	Using Omics to Understand Seasonal Weight Loss in Dairy Goats: An overview of Project GOATOMICS major achievements Mariana Palma, José Ricardo Parreira, Lorenzo E. Hernandez-Castellano, Juan Capote, Noemi Castro, Alexandre Campos, Anastasio Arguello, Manolis Matzapetakis, Susana S. Araújo & André M. Almeida aalmeida@isa.ulisboa.pt
1040	9	Comparison of two methods of milk fatty acids composition to detect SARA (subacute rumen acidosis) in dairy goats Sylvie Giger-Reverdin, Pablo G. Toral, Pilar Frutos, Gonzalo Hervas & Daniel Sauvant sylvie.giger-reverdin@agroparistech.fr
1050	Coffee and Posters	
Scientific Session 1 continued		
1115	10	The acclimatisation process in dairy cows with different milk yield potential - searching for reliable biomarkers Flávio Silva, Cristina Conceição Pinheiro, Liliana Cachucho, Catarina Matos, Ana Geraldo, Elsa Lamy, Fernando Capela e Silva & Alfredo Pereira ccp@uevora.pt
1125	11	Effects of Spirulina spp. supplementation to dairy cows' ration on animal heat stress Maria-Anastasia C Karatzia, Evangelia S Sossidou karatzia@rias.gr
1135	Current Project Awareness Session	

A panel of invited speakers will introduce their ongoing research projects. Please see the separate programme for details.
If you are involved in a relevant project and would like to join the panel please email dairy@care@sund.ku.dk

Scientific Session 2: Abstracts related to WG2 Activity		
1235	12	Effects of prenatal heat stress on emotional reactivity and behavioral reactions of female dairy goat kids Wellington Coloma-García, Nabil Mehaba, Ahmed A.K. Salama, Xavier Such & Gerardo Caja wncg_100583@hotmail.com
1245	13	Evaluation of Heart Rate and Lying Behaviour to Predict Calving of Dairy Cows Heiko Georg, Silke Beintmann, Anja Schwalm, Gracia Ude heiko.georg@thuenen.de
1255	14	Relationship between metabolic status and behaviour in dairy cows in early lactation Renny J. van Hoeij, Akke Kok, Rupert M. Bruckmaier, Marie J. Haskell, Bas Kemp & Ariette T.M. van Knegsel ariette.vanknegsel@wur.nl
1305	15	Changes in the Social Network when Separating High- and Low-productive Dairy Cows Paul Koene paul.koene@wur.nl
1315	16	Automated detection of lameness in dairy cows compared with claw diagnosis and mobility score Vivi M Thorup ¹ & Nick J Bell v.thorup@icerobotics.com
1325	Lunch and Posters	
1420	Plenary Review of DairyCare's Biomarker Research Achievements and Future Prospects <i>(Ali Mobasher, Surrey and Andre Almeida, Lisbon)</i>	
Scientific Session: Cow and Calf Together Incubator Group		
1450	17	Managing Cow and Calf Together: Report of the DairyCare Incubator Group Sigrid Agenäs Sigrid.agenas@slu.se
1505	18	Cow-calf contact systems for dairy: status of the literature Rebecca K. Meagher & Marina A.G. von Keyserlingk r.k.meagher@reading.ac.uk
1515	19	The Evaluation of Commingled Calves and Dams versus Separated Calves and Dams on Behavior, Physiology, and Production Amanda R Lee, Ashley D Campaoux, Melissa C Cantor, Joao HC Costa & Peter D Krawczel alee90@vols.utk.edu
1525	20	Effects of suckling on milk yield and milk composition in dam rearing systems Kerstin Barth kerstin.barth@thuenen.de
1535	21	Using an automated milk feeder during the suckling period will reduce stress behaviour at separation Julie Føske Johnsen, Cecilie M. Mejdell, Annabelle Beaver, Anne Marie dePassille, Jeffrey Rushen & Daniel M. Weary cecilie.mejdell@vetinst.no
1545	22	Feeding behavior of dairy calves reared by the dam with access to automatic milk feeders Kristine Piccart, Stephanie Van Weyenberg, Dan Weary & Julie Johnsen Kristine.Piccart@ilvo.vlaanderen.be
Scientific Session: Validation Protocols Incubator Group		
1555	23	Towards a validation protocol for sensor information in dairy herd management Amira Rachah, Olav Reksen, Dan Christoffer Jansen, Peter Løvendahl amira.rachah@nmbu.no
1605	24	Assessing ovulation time in dairy cows: experiences from estrus detection validation studies Ines Adriaens, Bart De Ketelaere, Wouter Saeys & Ben Aernouts ines.adriaens@kuleuven.be
1615	25	Real-time animal response to climate changes Harel Levit, S Goldshtein, S.Pinto, AK Elazari, V Bloch, Y Ben Meir, E Gershon, J Miron & I Halachmi harelle@volcani.agri.gov.il
1625	Coffee, Tea and Posters	
1650	Plenary Review of DairyCare's Systems Research Achievements and Future Prospects <i>(Tomas Norton, KU Leuven)</i>	
1730	Management Committee Meeting	
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Tuesday 20th March		
0830		Reflections on DairyCare <i>(Chris Knight, UK)</i>
0850		Guest presentation: How research on the welfare of animals can contribute to the EU policy on animal welfare <i>(Denis Simonin, Head of Animal Welfare Sector at EU)</i>
Scientific Session: Abstracts related to WG3, Systems		
0920	26	Bayesian estimation of genetic parameters highly associated with health traits in cattle Radovan Kasarda, Michal Vlček & Nina Moravčíková radovan.kasarda@uniag.sk
0930	27	Early Detection of Mastitis in Dairy Cattle through Sensor Data Combination Chris Davison, Craig Michie, Michael Gilroy, Ivan Andonovic christopher.davison@strath.ac.uk
0940	28	Rumination Detection in Dairy Cattle Using Acceleration Based Bolus Sensors Andrew Hamilton, Chris Davison, Ivan Andonovic, Craig Michie andrew.w.hamilton@strath.ac.uk
0950	29	"ProDairyWelfare" – proactive productivity and health management in Dairy Farming Mario Fallast mario.fallast@smaXtec.com
1000	30	Evaluation of Cow Feed Mass by Photogrammetry Victor Bloch, Harel Levit, and Ilan Halachmi victorc@volcani.agri.gov.il
1010	31	Using recycled manure solids as a bedding material in a freestall dairy barn Lilli Frondelius, Heli Lindeberg, Jenni Laakso and Matti Pastell lilli.frondelius@luke.fi
1020	32	Cattle and Sheep Welfare during Transport: What are the Good and the Best Practices to improve this? Sossidou E.N, Nalon E., De Briyne N. & Spoolder H. A.M. sossidou.arig@nagref.gr
1030	Coffee and Posters	
Scientific Session: Small Ruminant Sensors Incubator Group		
1050	33	Sensors for Small Ruminants: Report of the DairyCare Incubator Group Gerardo Caja gerardo.caja@uab.es
1105	34	Current and future prospects for the use individual animal data interpretation to optimize dairy goat farm management Alejandro Belanche, A. Ignacio Martín-García, Javier Fernández & David R. Yáñez-Ruiz a.belanche@csic.es
1115	35	Embedding Sensor Technologies as Part of a Holistic Farming Concept Max Seybold max@almweide.com
1125	36	Automatic identification of very thin dairy goats using image technology George Stilwell, Susana Brandão, Ana Vieira stilwell@fmv.ulisboa.pt
1135	37	Temperature rumen bolus able to record intake and drinking behavior for dairy small ruminants Joan Oliver, Carles Ferrer, Alejandro Peralta, Andreia Castro-Costa, Ahmed A. K. Salama & Gerardo Caja carles.ferrer@uab.cat
1145	Plenary Review of DairyCare's Activity Research Achievements and Future Prospects <i>(Marie Haskell, UK)</i>	
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Monday 19th March at 11.35 : 12.35
Current Project Awareness Session

Katerina Marinou: Greek national animal welfare strategies

Richard Lloyd: EU H2020 4D4F Thematic Network <http://www.4d4f.eu/>

Dinu Gavojdian: EU H2020 SheepNet Network <http://www.sheepnet.network/>

David Eckersall: EU H2020 Marie Sklodowska-Curie Action MANNA

George Stilwell: EU Erasmus+ ANICARE

Ivan Andonovic: EU H2020 IoF2020 <https://www.iof2020.eu/>

Chris Knight: UK Agri-EPI Centre <https://www.agri-epicentre.com/>

Christina Ligda: EU ERA-NET ARIMNet2 www.arim-perform.net

Georgios Arsenos: EU H2020 Project iSAGE <http://www.isage.eu/>

Posters

P1	The role of Staphylococcus aureus virulence factors in the infection of bovine mammary epithelial cells Karin Artursson, Yusak Budi Susilo, Lihong Liu, Jonas Bergquist & Jenny Schelin karin.artursson@sva.se
P2	The effect of heat stress on some metabolic parameters and prevalence of metabolic disorders in lactating cows – a retrospective study Mikolt Bakony, László Könyves, Péter Hejel, Péter Kovács, Endre Brydl, Viktor Jurkovich bakony.mikolt@univet.hu
P3	The differences in teat-end hyperkeratosis between Holstein and Jersey dairy cows Tina Bobić, Pero Mijić, Maja Gregić, Mirjana Baban, Marcela Šperanda, Vesna Gantner tbobic@pfos.hr
P4	Comparison of biochemical markers in early lactated dairy cows kept in two different housing systems Irena Celeska, Igor Dzadzovski, Miroslav Radeski, Vlatko Ilieski & Danijela Kirovski iceleska@fvm.ukim.edu.mk
P5	Metabolic status of dairy cows grouped by their anabolic and catabolic indicators of metabolic stress (insulin, insulin like growth factor-I and non-esterified fatty acids) in early lactation Marko R. Cincović, Branislava Belić, Radojica Đoković, Jožica Žežek, Gordana Devečerski, Milun D. Petrović & Jože Starič joze.staric@vf.uni-lj.si
P6	Omic reveals a leaky gastrointestinal tract and hormone regulation impairment in heat-stressed dairy goat Alexandra Contreras-Jodar, Nazri Nayan, Soufiane Hamzaoui, Gerardo Caja & Ahmed A K Salama gerardo.caja@uab.es
P7	Factors influencing the calf viability at birth Ludovic T. Csiszter, Daniela E. Ilie, Dinu Gavojdian & Radu I. Neamt cziszterl@animalsci-tm.ro
P8	Blood and milk parameters in dairy cows kept on different slope of straw deep litter Mislav Đidara and Marcela Šperanda mdidara@pfos.hr
P9	Dairy ewes adapt to the proportion of concentrate in the diet (30 to 60%) without effects on their milk performances from early-lactation Abdelali Elhadi, Gerardo Caja, Ahmed Salama, Miriam Mendivil, Eduardo Durán & Elena Albanell abdelali.elhadi@uab.cat
P10	Relationship between some animal-based measures collected at herd-level and the exposure of dairy cows to poor management and housing conditions Francesca Fusi, Valentina Lorenzi, Alessandra Angelucci, Rosa Maria Strano, Jessica Ginestreti, Giandomenico Ferrara, Luigi Bertocchi francesca.fusi@izsler.it
P11	Selection of optimal method for estimation of methane emission on dairy cattle farms Vesna Gantner, Maja Gregić, Tina Bobić, Pero Mijić & Marcela Šperanda vgantner@pfos.hr
P12	Effects of horns on production efficiency in dual-purpose Fleckvieh cows Dinu Gavojdian, Radu Neamt, Ludovic Csiszter, Ioana Nicolae & Daniela Ilie gavojdian_dinu@animalsci-tm.ro
P13	Sucking behaviour in Holstein calves with intensive milk feeding and butyrate supplementation Caroline Gerbert, Dörte Frieten, Christian Koch, Georg Dusel & Harald M. Hammon
P14	A preliminary study on antibiotic usage in Italian dairy herds: the DDDAit method Jessica Ginestreti, Valentina Lorenzi, Francesca Fusi, Alessandra Angelucci, Rosa Maria Strano, Giandomenico Ferrara, Federico Scali, Giovanni Loris Alborali & Luigi Bertocchi gin.jessica91@gmail.it
P15	Biomarkers in exosomes in cattle diseases Leticia Gomes de Pontes, Amanda Festa Sabes, Asier Galan, Petra Nižić Bilić, Nicolas Guillemin, Josipa Kuleš, Anita Horvatić, Rui Seabra Ferreira Junior, Benedito Barraveira, Vladimir Mrljak, Peter David Eckersall & Lucilene Delazari dos Santos leticiapontesproteomica@gmail.com
P16	Potential of domestic equine for milk production in Croatia Maja Gregić, Mirjana Baban, Pero Mijić, Tina Bobić, Marcela Šperanda & Vesna Gantner mgregic@pfos.hr
P17	Evaluating SNPs in BoLA-DRB3 gene for association with lameness in the Romanian cattle breeds) Daniela E Ilie, Dinu Gavojdian, Radu I Neamt, Florin C. Neciu & Ludovic T Csiszter danailie@animalsci-tm.ro
P18	Cows' monitoring scheme in Croatia using milk recording data Zdenko Ivkić, Ivica Vranić, Marija Špehar, Drago Solić, Zdravko Barać zivkic@hpa.hr
P19	Effect of Spirulina ssp. supplementation in heat stressed dairy cows' ration on milk fatty acid profile Maria-Anastasia C Karatzia, Evangelia S Sossidou, Maria Ioannidou karatzia@rias.gr
P20	The effect of body condition during pregnancy on the cow's colostrum quality Danijela Kirovski ^{1*} , Snežana Stevanović Đorđević ¹ , Ljubomir Jovanović ¹ , Sreten Nedić ¹ , Julijana Trifković ² , Željko Sladojević ³ dani@vet.bg.ac.rs

P21	How many ketotic cows are unable to be diagnosed for ketosis using a glucometer? Zygmunt M. Kowalski, Marta Malkiewicz and Wojciech Jagusiak rkowals@cyf-kr.edu.pl
P22	Scoring welfare status in a Turkish dairy farm by using some welfare quality® standards Ekrem Lacin, Omer Coban, Nilüfer Sabuncuoglu & Murat Genc ekremlacin@hotmail.com
P23	Are farmers taking care about the future of their dairy herd? Valentina Lorenzi, Francesca Fusi, Alessandra Angelucci, Rosa Maria Strano, Jessica Ginestreti, Giandomenico Ferrara & Luigi Bertocchi valentina.lorenzi@izsler.it
P24	Evaluation of a calving time detection technology that monitors tail movement in dairy cattle Sarah E. Mac, Carissa M. Truman, and Joao H.C. Costa costa@uky.edu
P25	Effects of heat stress on the lactational performances of Lacaune dairy ewes at late lactation P25Nabil Mehaba, Wellington Coloma, Ahmed Salama, Xavier Such & Gerardo Caja nabil-bra@hotmail.fr
P26	Grazing resources for dairy production in Croatia Pero Mijić, Tina Bobić & Vesna Gantner pmijic@pfos.hr
P27	Behavioral changes of grazing cows around calving measured by low temporal resolution IoT sensors Francisco Maroto Molina, Sara Flores Olmos, José E. Guerrero Ginel, Ana Garrido Varo & Dolores C. Pérez Marín g02mamof@uco.es
P27	Comparison of welfare assessment results from Welfare Quality® and a national system on Italian dairy farms Mikaela Mughal, Luigi Bertocchi, Francesca Fusi, Alessandra Angelucci & Valentina Lorenzi mikaela.mughal@uef.fi
P28	Functional and production traits in Romanian Black Spotted dairy cows Ioana Nicolae, Marinela Enculescu & Dinu Gavojdian ioana_nicolae2002@yahoo.com
P30	Dairy calf management and animal welfare Metin Petek petek@uludag.edu.tr
P31	Dietary supplement of conjugated linoleic acids or polyunsaturated fatty acids suppressed the mobilization of body fat reserves in dairy cows at early lactation through different pathways Nanbing Qin, Ali-Reza Bayat, Erminio Trevisi, Andrea Minuti, Pii Kairenius, Sirja Viitala, Mervi Mutikainen, Heidi Leskinen, Kari Elo, Tuomo Kokkonen and Johanna Vilkki nanbing.qin@helsinki.fi
P32	Calves' health and welfare issues in small-scale farms Renata Relić, Jože Starič & Jožica Ježek jozica.jezek@vf.uni-lj.si
P33	Digital radiographic of distal extremities of limbs in sheep with acute ruminal lactic acidosis experimentally induced Amanda Festa Sabes, Annita Morais Girardi, Leticia Gomes de Pontes, Vladimir Mrljak, Peter David Eckersall & Luiz Carlos Marques amanda.festa@hotmail.com
P34	Health and welfare status of intensively reared dairy sheep in Greece Evangelia Sossidou, A. Gelasakis & A. Kalogianni sossidou.arig@nagref.gr
P35	Main causes of culling in dairy cows: preliminary study in Northern Italy herds Rosa Maria Strano, Jessica Ginestreti, Valentina Lorenzi, Francesca Fusi, Alessandra Angelucci, Giandomenico Ferrara, Luigi Bertocchi rosamaria.strano@izsler.it
P36	Incidence and impact of lameness on ewes' milk production of new breed Slovak dairy ewe and Lacaune Vladimír Tančín, Štefan Baranovič, Jana Margetínová, Lucia Mačuhová & Michal Uhrinčat tancin@vuzv.sk
P37	Influence of seasonal heat stress on reproductive performance in dairy cows Romana Turk, Ožbalt Podpečan, Janko Mrkun & Petra Zrimšek rturk@vef.hr
P38	Modeling the attitudes of Greek sheep farmers towards Animal Health and Welfare I. Tzouramani, E.N. Sossidou, A. Sintori & A. Lontakis sossidou.arig@nagref.gr
P39	The Comparison of Nutrient Requirements and Nutrient Intake of Holstein Friesian Cows Fed by TMR Engin Ünay and İbrahim Çiftçi e_unay@hotmail.com
P40	Effect of body condition on the oxidative status in dairy cows Christiane Urh , Katharina Schuh, Georg Dusel, Christian Koch & Helga Sauerwein urh@uni-bonn.de

P41	<p>Conjugated linoleic acid, but not α-linolenic acid improved energy status in dairy cows fed a diet with reduced n-3 fatty acid content during the transition period</p> <p>Laura Vogel, Martina Gnott, Claudia Kröger-Koch, Joachim Weitzel, Arnulf Tröscher, Alexander Starke and Harald M. Hammon hammon@fhn-dummerstorf.de</p>
P42	<p>Effect of Yucca Schidigera Extract on In Vitro Nutrient Digestibility, Rumen VFA, Anti-microbial Activity, Biological Blood Parameters and Antioxidant Capacity</p> <p>Sema Yaman, Engin Ünay and Pinar Özdemir semayaman60@yahoo.com</p>
P43	<p>Metabolomic Study of Dietary Amino Acid Supplementation in Dairy Calves</p> <p>Kuai Yu, Manolis Matzapetakis, Daniel Valent, Gary J. Salazar, Andre Almeida, Marta Terré & Anna Bassols kuai.yu@uab.cat</p>
P44	<p>Loose Housing Systems Affect The Welfare Indicators Parameters in Dairy Farms in Southern Spain</p> <p>Laura Molina, Carlos C. Pérez-Marín, Estrella Agüera vet.lauramolina@gmail.com</p>
P45	<p>Using ICT Technologies to Compile Life Cycle Inventories of Cow-Milk Production Chains</p> <p>Vasileios Anestis, Thomas Bartzanas & Dimitrios Papanastasiou thomas.bartzanas@gmail.com</p>
P46	<p>Development of an ELISA for the measurement of the acute phase protein inter alpha trypsin inhibitor heavy chain 4 (ITIH4) in serum and milk samples from cows</p> <p>Lourdes Soler, N García, M Bochniarz, R Dąbrowski, F Lampreave, M A Álava & M Piñeiro lourdes.soler.baigorri@gmail.com</p>
P47	<p>The importance of the addition of vitamin and mineral mixture in dairy cow nutrition</p> <p>Tatjana Pirman & Andrej Lavrenčič tatjana.pirman@bf.uni-lj.si</p>