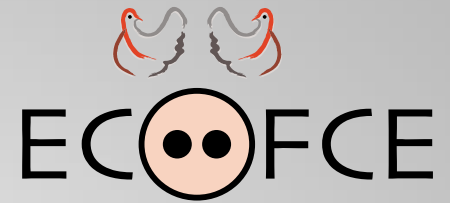


EFFICIENT & ECOLOGICALLY-FRIENDLY PIG AND POULTRY PRODUCTION.

A WHOLE-SYSTEMS APPROACH TO OPTIMISING FEED EFFICIENCY
AND REDUCING THE ECOLOGICAL FOOTPRINT OF MONOGASTRICS.



BASIC DATA

Funding:

EU-FP7
(€ 6 million)

Start date:

1 February 2013

Duration:

48 months
(2013 to 2016)

The ECO-FCE project is funded by the European Union Seventh Framework Programme (FP7 2007/2013) under grant agreement No. 311794.



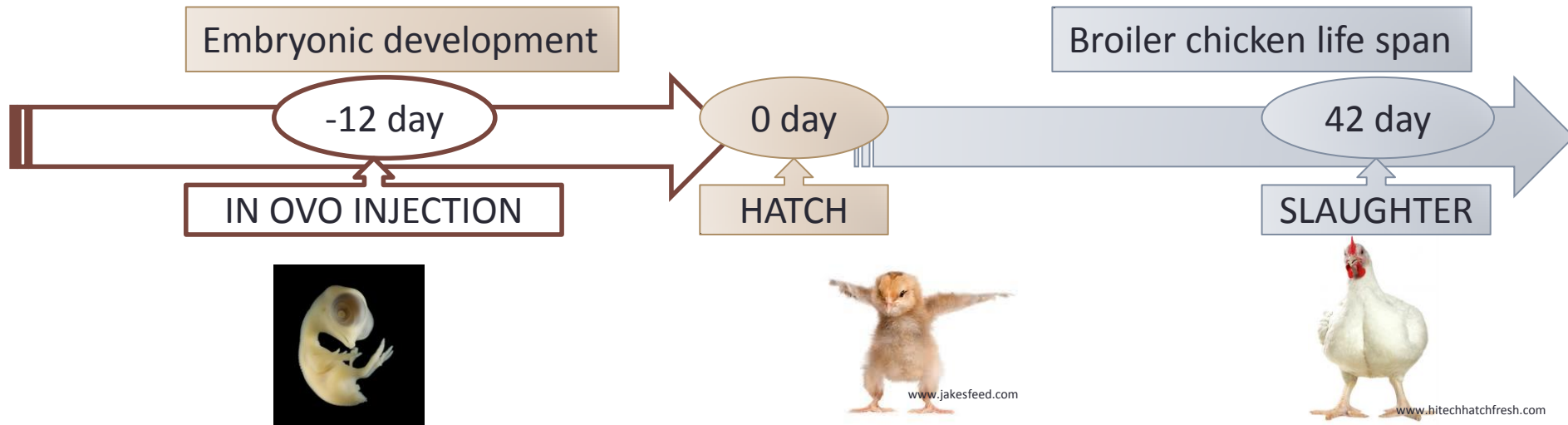
IN OVO SYNBIOTICS STIMULATION INFLUENCES GENE EXPRESSION RESPONSES IN THE FULL GROWN BROILER

Maria Siwek

University of Science and Technology, Bydgoszcz,
POLAND

Why in ovo technology?

To ensure the best protection for the newly hatched individual, the external supplementation should be given **as early as possible**





Technology for automatic in ovo pre/synbiotic administration

„In ovo „ technology –
can be scaled up

Aim



- How do two various synbiotics injected in ovo influence gene expression in selected tissues?
- How to create a synergistic synbiotic ?

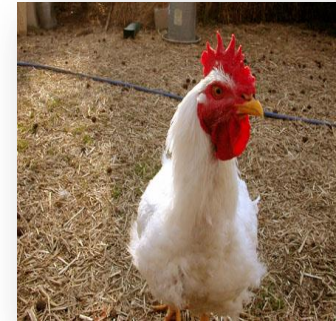
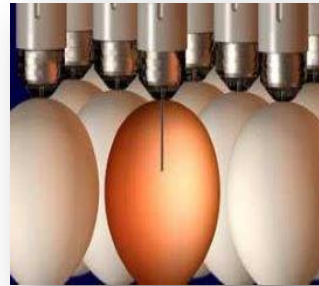


Incubation -12 days



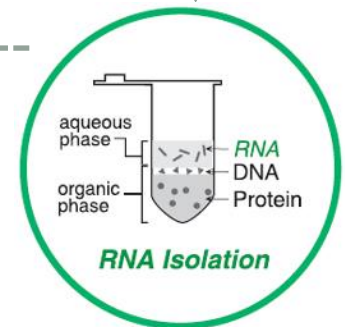
5850 embryos of broiler chickens (Cobb500FF)

Synbiotics administrated
in ovo



Tissues collection at 7th, 14th,
21st and 42nd day post
hatching

RT- qPCR analysis



Trizol + additional cleaning



Relative quantification
analysis, statistical methods

Experimental setup

Gene expression analysis



Immunological panel of genes:

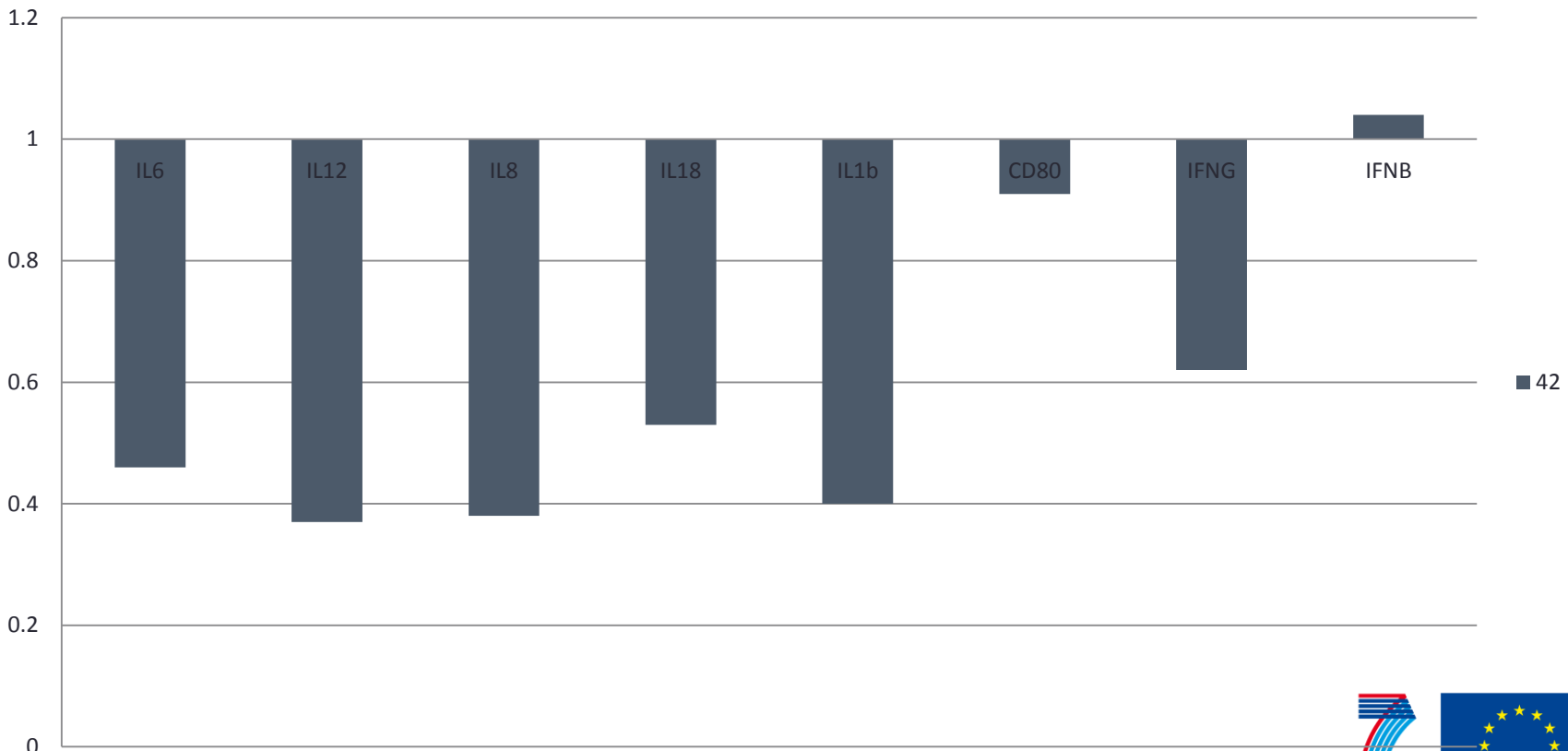
- ✓ Th1 cytokines ($IFN\gamma$, $IL12$)
- ✓ Th2 cytokines ($IL4$)
- ✓ antiviral cytokines ($IFN\beta$)
- ✓ proinflammatory cytokines ($IL12$, $IL1B$)
- ✓ chemokine ($IL8$)

Real Time quantitative PCR (LightCycler 480)

Primer sequences based on
Slawinska et al. 2014

Relative gene expression – cecal tonsils

Gene expression - Synbiotic 1

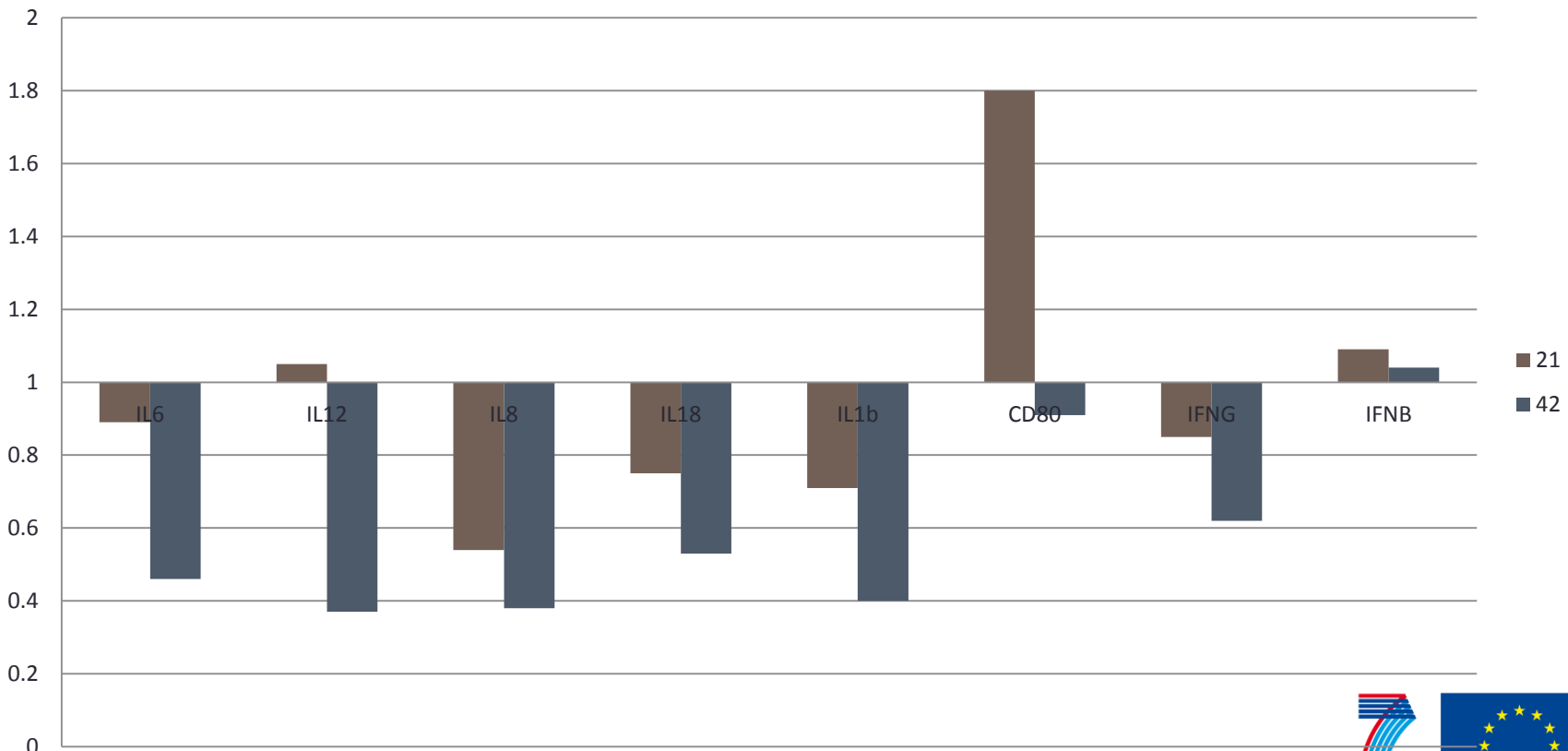


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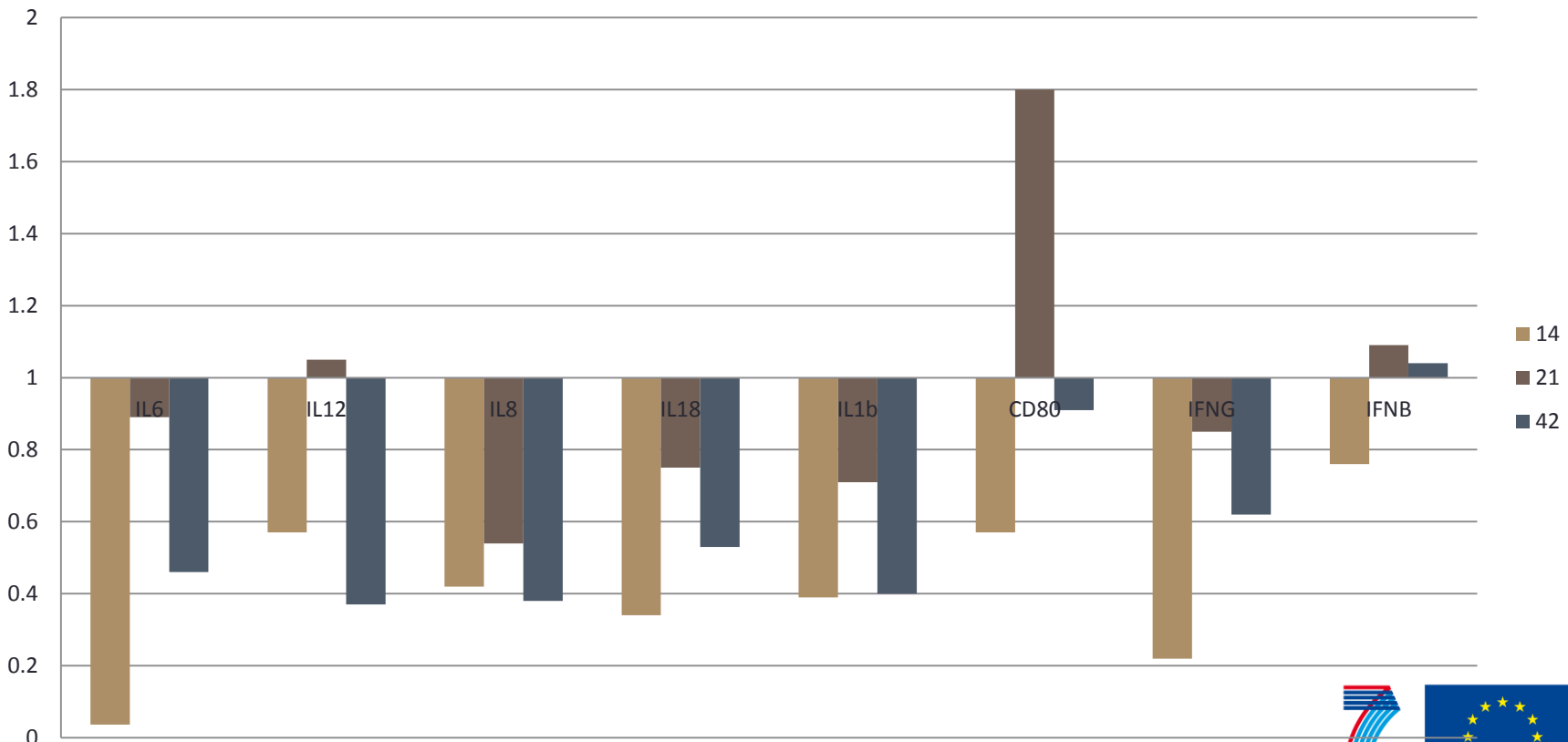
Relative gene expression – cecal tonsils

Gene expression - Synbiotic 1



Relative gene expression – cecal tonsils

Gene expression - Synbiotic 1

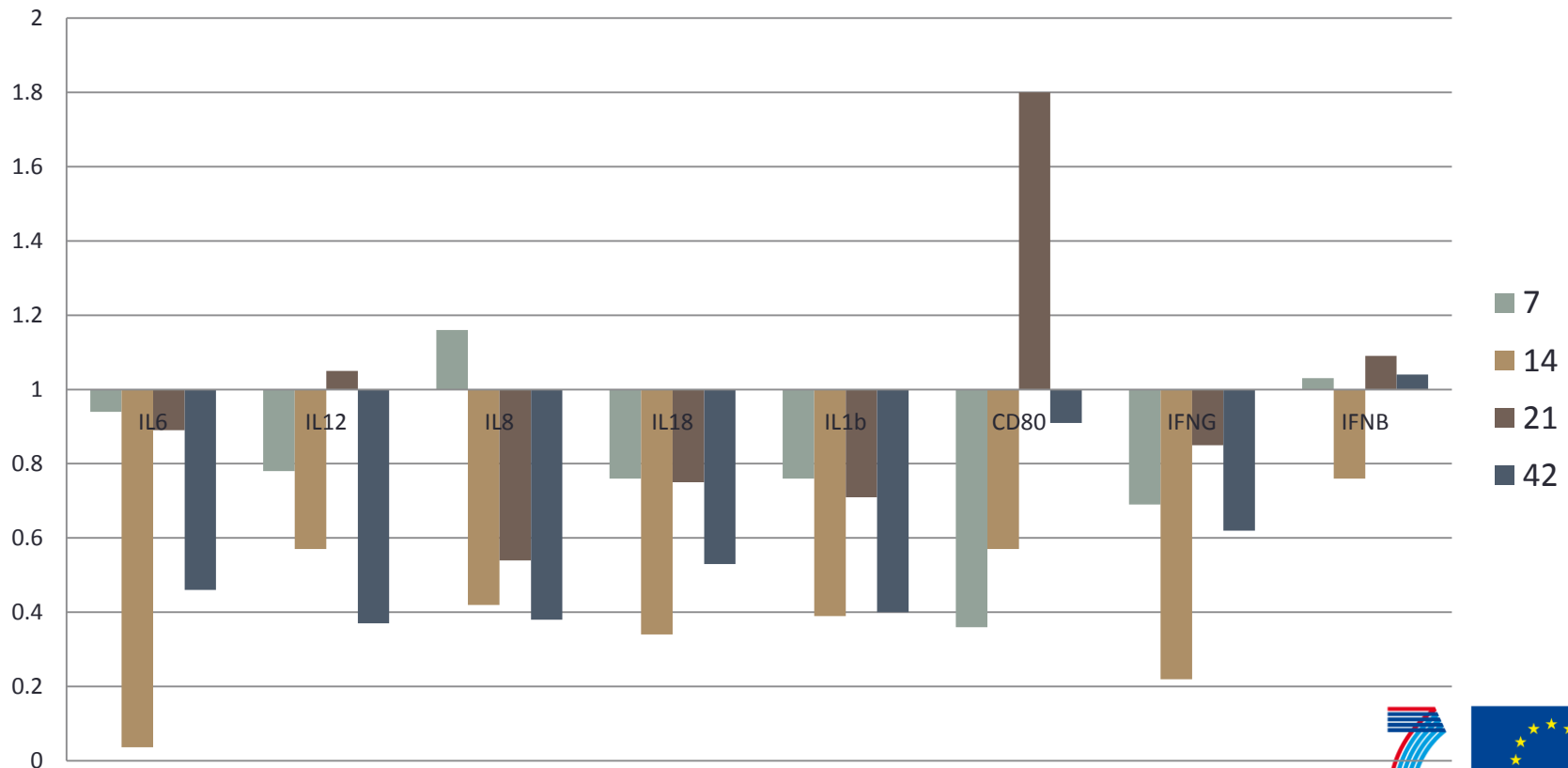


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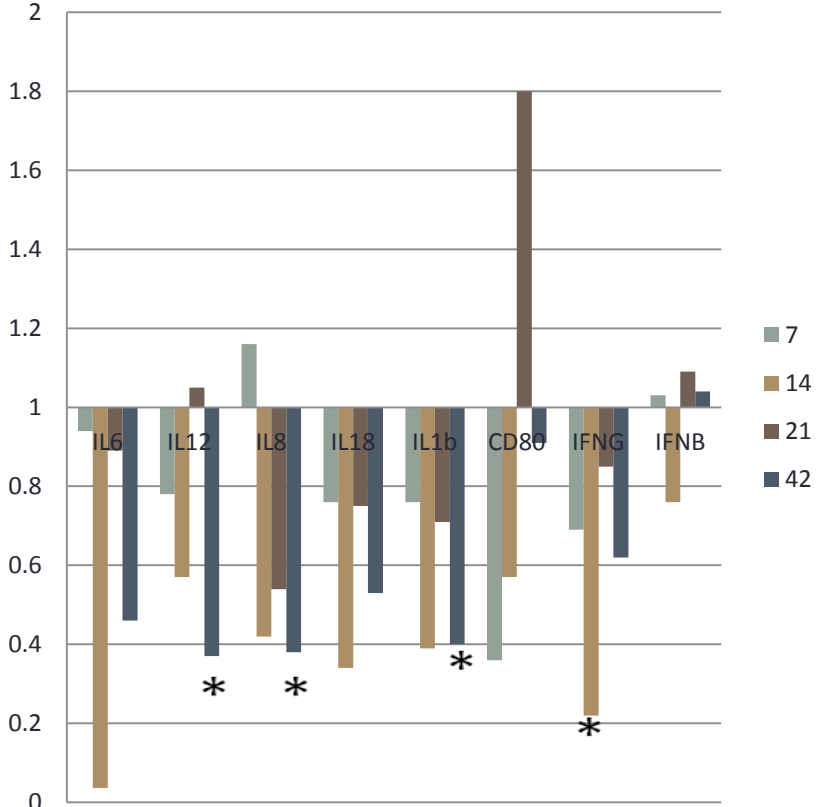
Relative gene expression – cecal tonsils

Gene expression - Synbiotic 1

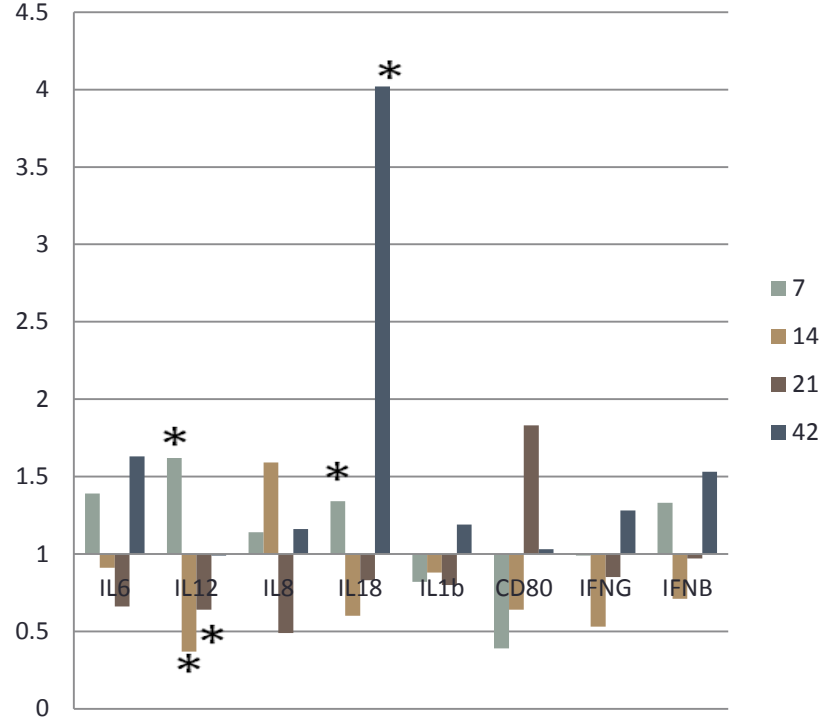


Relative gene expression – cecal tonsils

Gene expression - Synbiotic 1

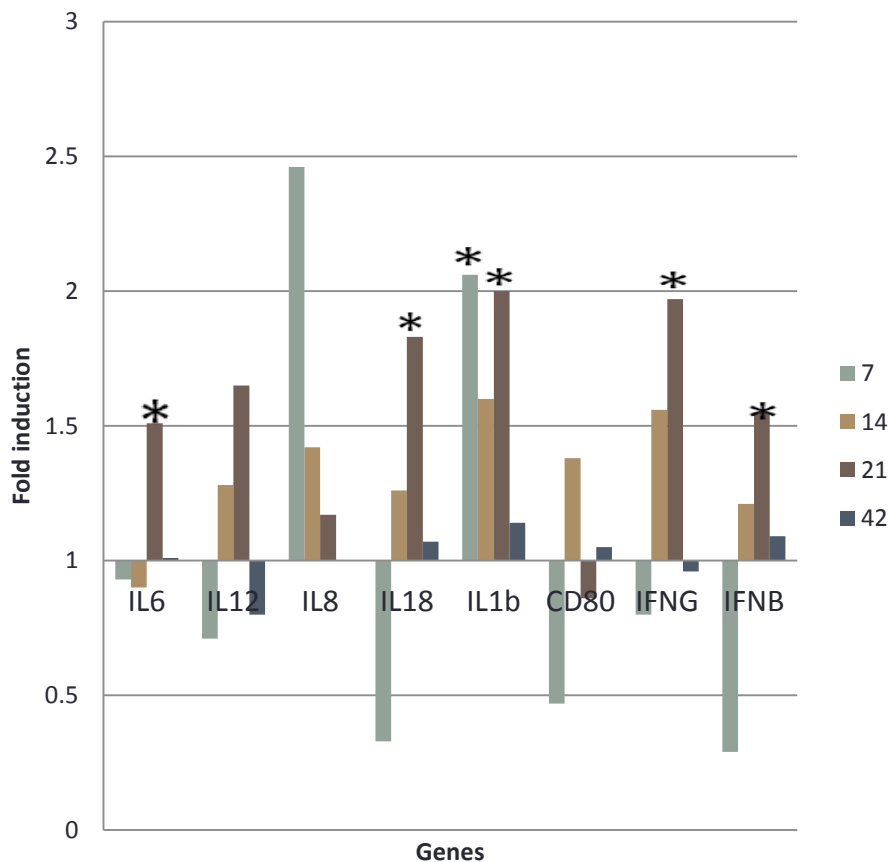


Gene expression - Synbiotic 2

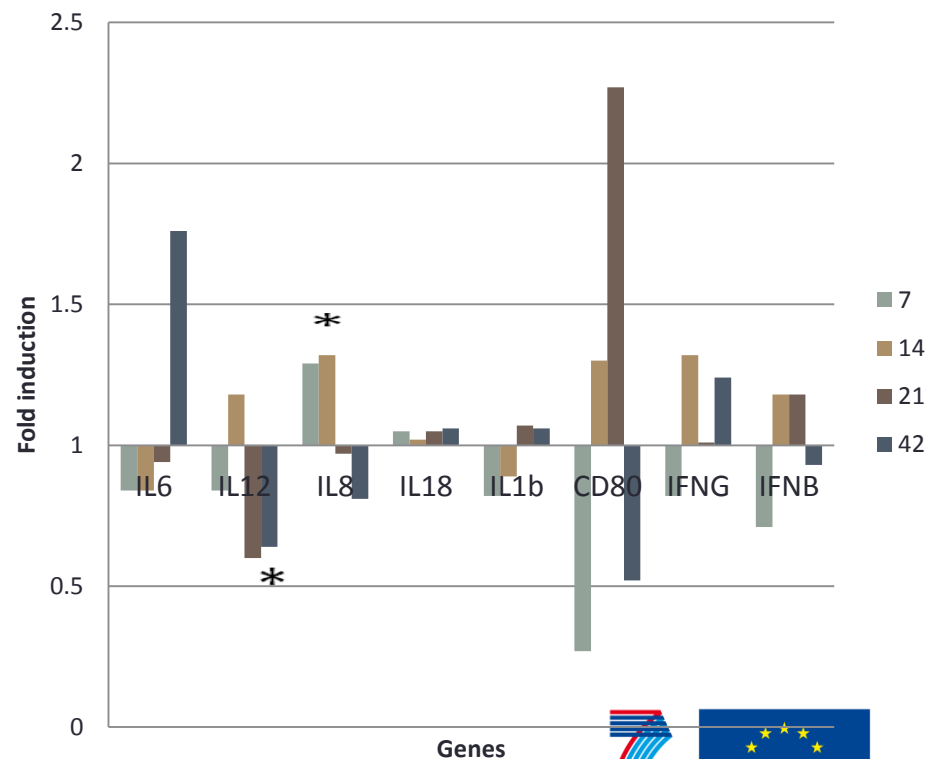


Relative gene expression - spleen

Lb. salivarius 3154 + Bi²tos



Lb. plantarum 3036 + RFO



selected bacterial or yeast cultures whose task is beneficial effect in the gastrointestinal tract



Synbiotic = **probiotic** + **prebiotic**

Control – 0,9% NaCl

substance present in or introduced into the food to stimulate the growth of gut flora

Synbiotic 1-

Lb. salivarius IBB3154 + Bi²tos, Clasado Ltd.

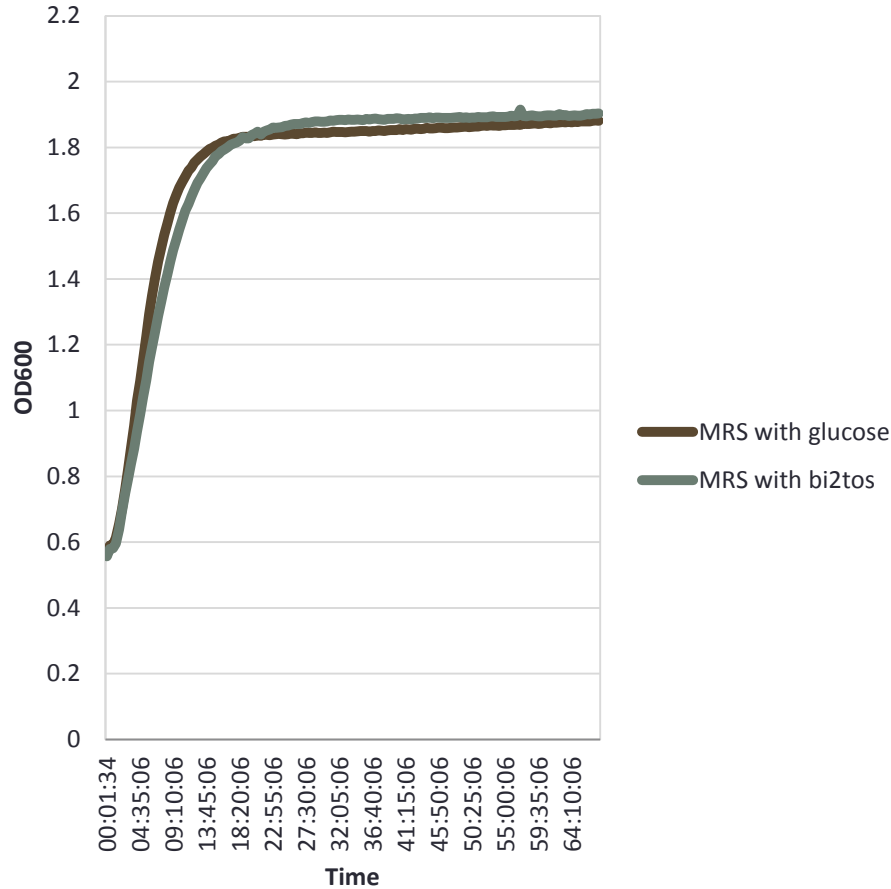


Synbiotic 2 –

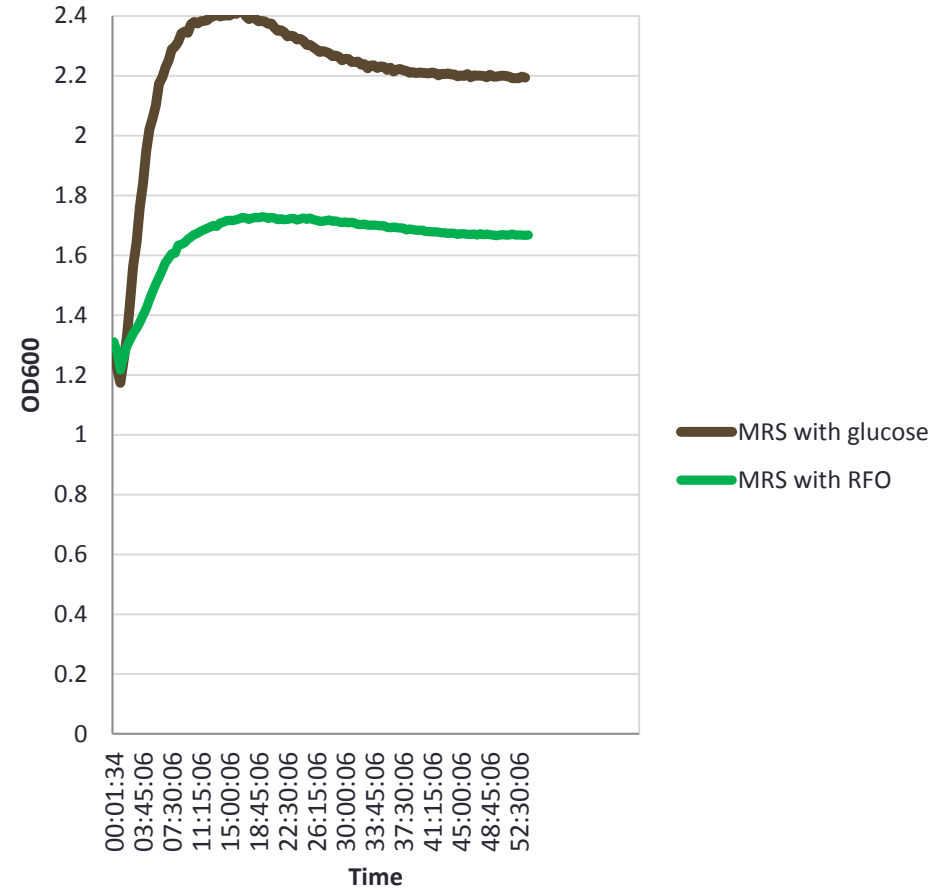
Lactobacillus plantarum IBB3036 + lupin RFOs

Bioscreen

Lb. salivarius 3154 + Bi²tos



Lb. plantarum 3036 + RFO



measured using a broadband filter (420nm-580nm wavelength range)

Conclusions



- Single dose *in ovo* injection has long term consequences for growing animal
- Synbiotics follow entry route into the body
- Synbiotic 1 is better than Synbiotic 2

- single low dose of **in ovo injected bioactive** might successfully **replace** an inclusion of pre/ probiotics **into the chicken diet**



Acknowledgments

- Aleksandra Dunisławska
- Mariana Valentim Narcisio
- Anna Sławińska
- Arkadiusz Płowiec
- Marek Bednarczyk



THANK YOU