

How to implement Precision Livestock Farming? Looking back at ATF/EAAP Special Session on Precision Livestock Farming

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Animal Task Force
Brussels
17th of November 2015

Overview

- Challenges for Livestock Production
- PLF examples
- EU-PLF project
- Feedback from farmers
- How to implement: Blueprint
- Value Creation
- Conclusions

Challenges for livestock production

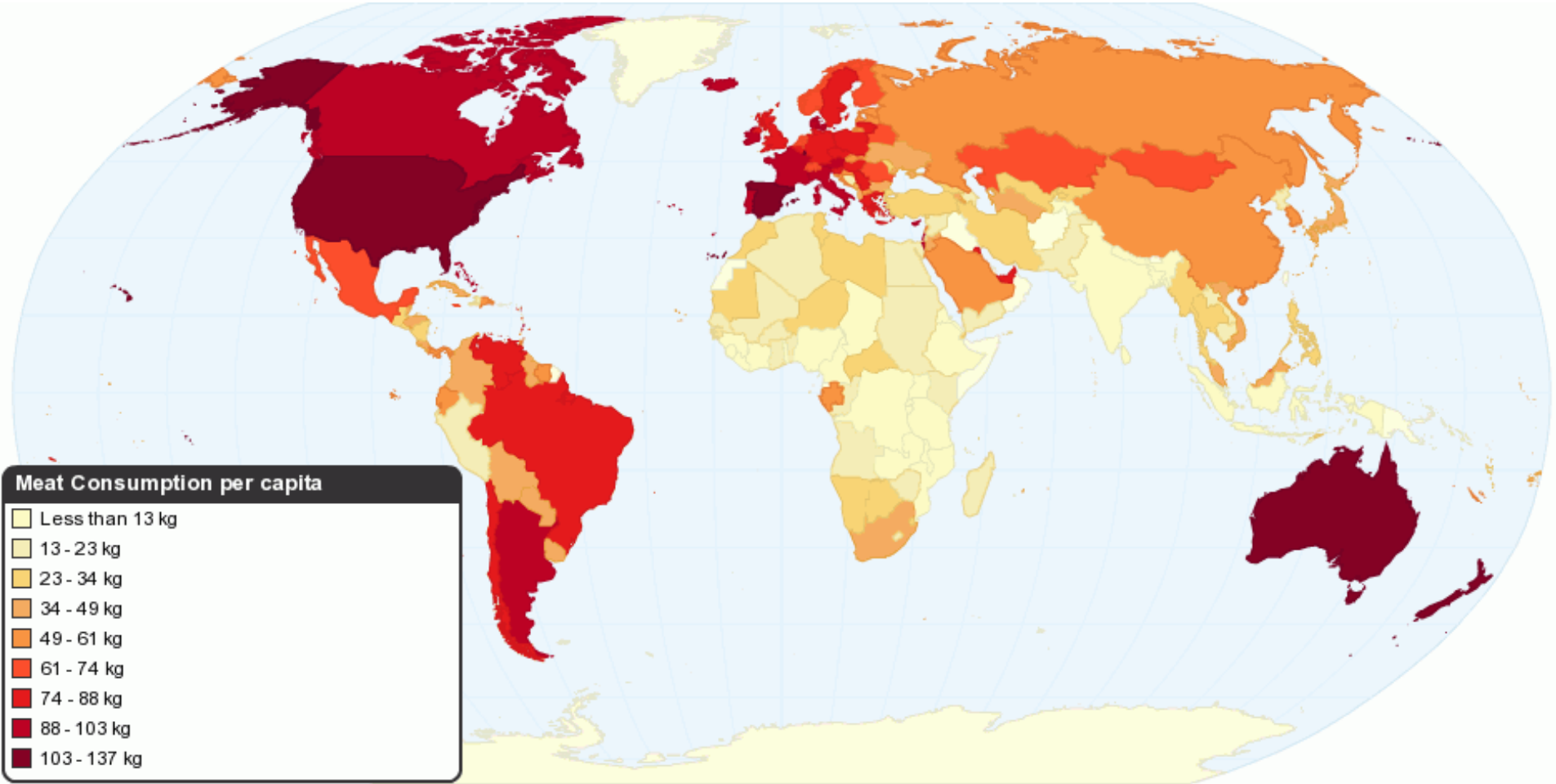
Problem of monitoring animals

- Livestock farming in the past ...



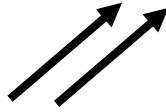
Farmer had the time to use audio-visual scoring

Worldwide Individual Meat Consumption

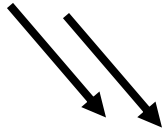


Source: FAO (2010)

Numbers of animals



Number of farmers



Resulting in



↳ High number of animals per farm

↳ Less available time per individual animal

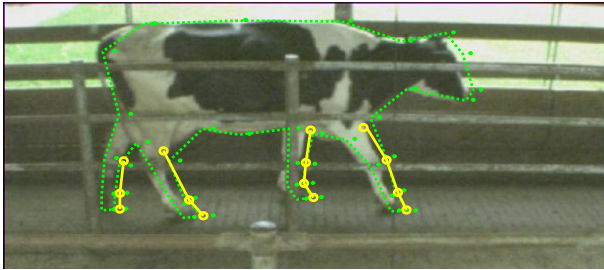
↳ More welfare and other problems

Challenges for livestock production

- Over 60 billion animals are slaughtered every year, increase with up to 40%?
- **Health:** Relationship between animal health and healthy food
- **Animal welfare** (e.g. EU)
- **Environmental Issues**
- **Social importance**
- **Economic importance** including Valorisation of knowledge

PLF examples

Precision Livestock Farming (PLF)



Management of livestock by continuous automated real-time monitoring of production/reproduction, health and welfare of livestock and environmental impact.

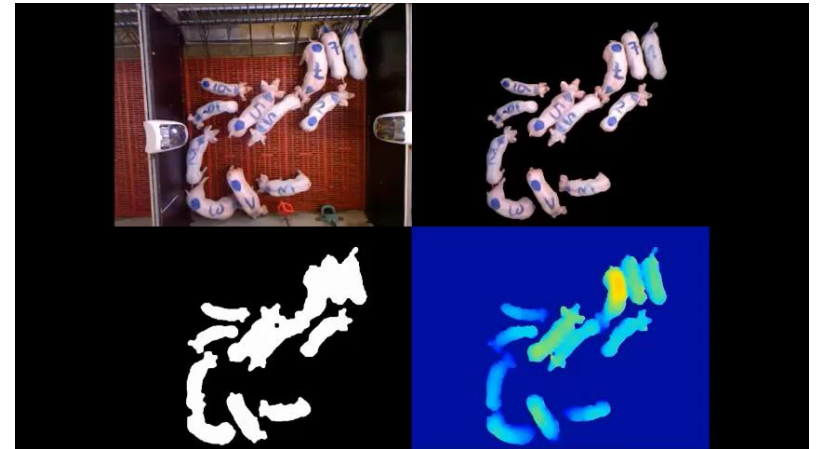


Europe is investing in PLF technology

Cow lameness monitor: i.c.w. Volcani, DeLaval, Wur **Aggression monitor:** Umil, TIHO, Fancom BV



Play



Play

Scratching behaviour: Ughent, ILVO



play

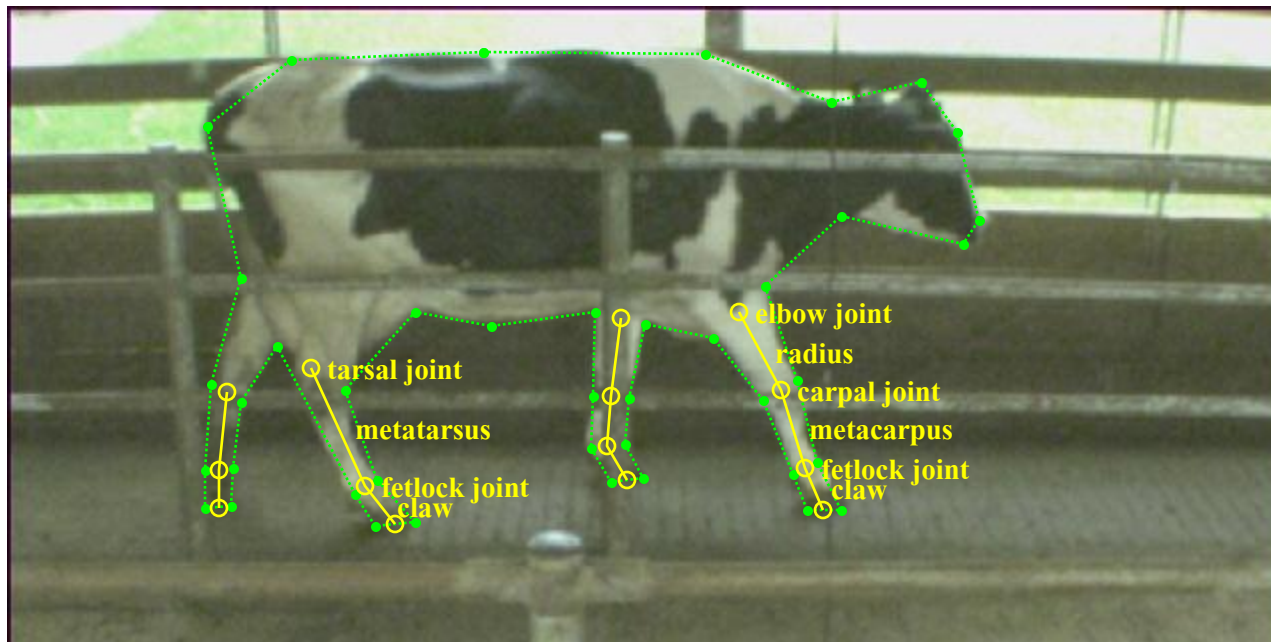
Weight estimation: Fancom BV, Agrifirm



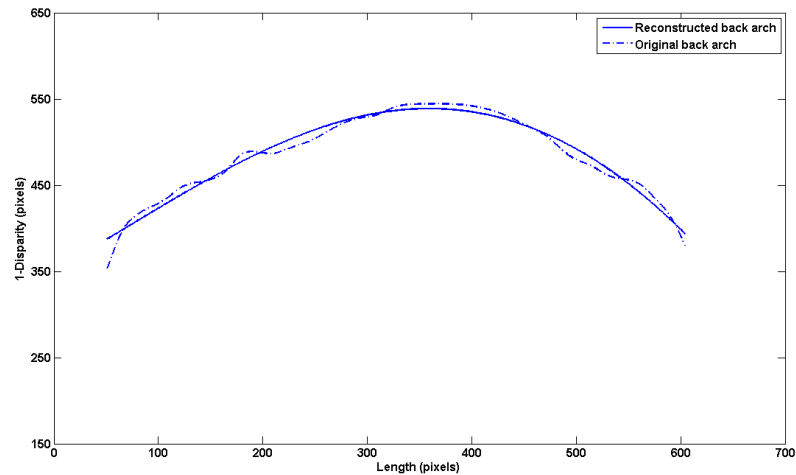
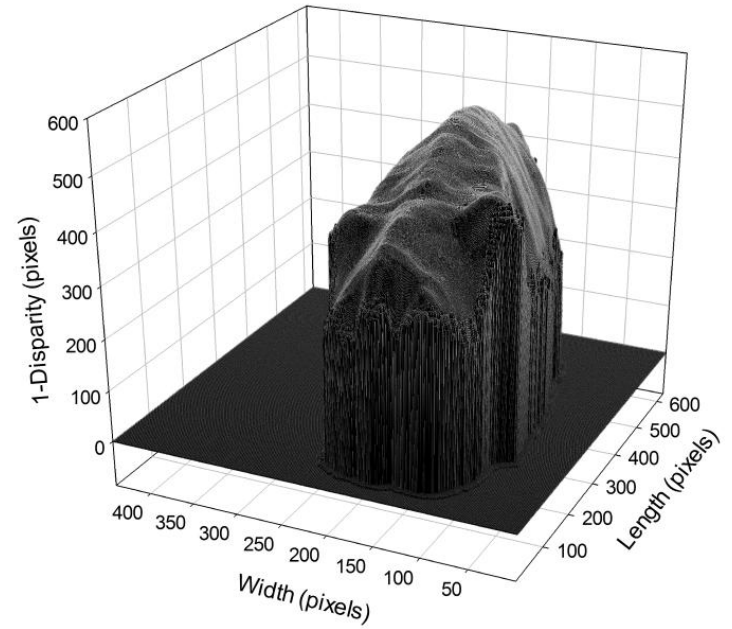
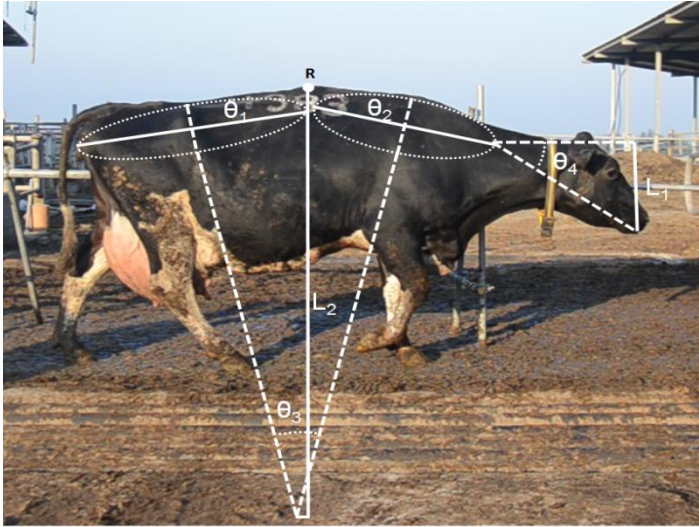
Play

Real time lameness detection

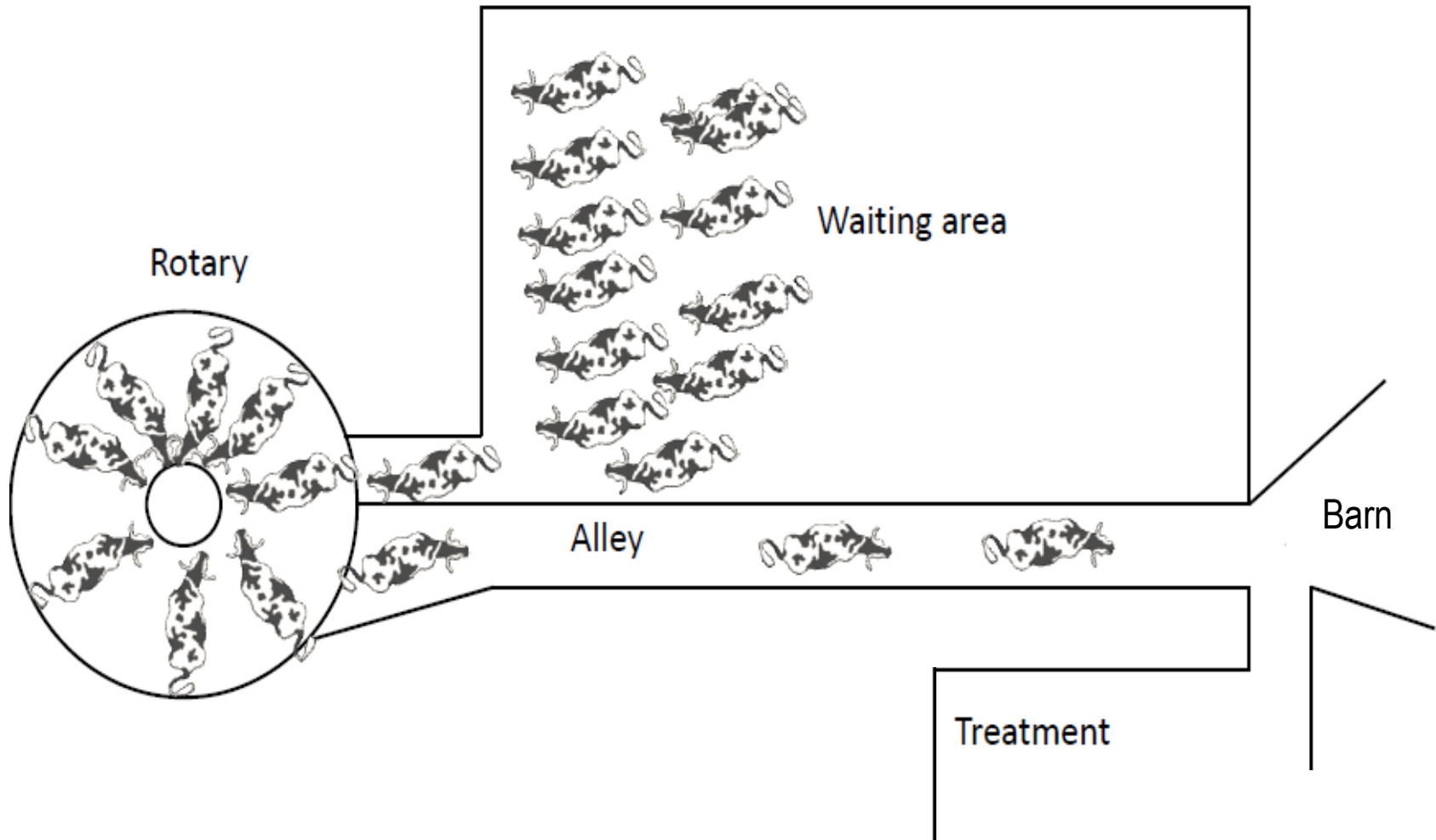
- Deformable model, fit on contour in the image
- Robust
- Adapts to each individual (holistic)



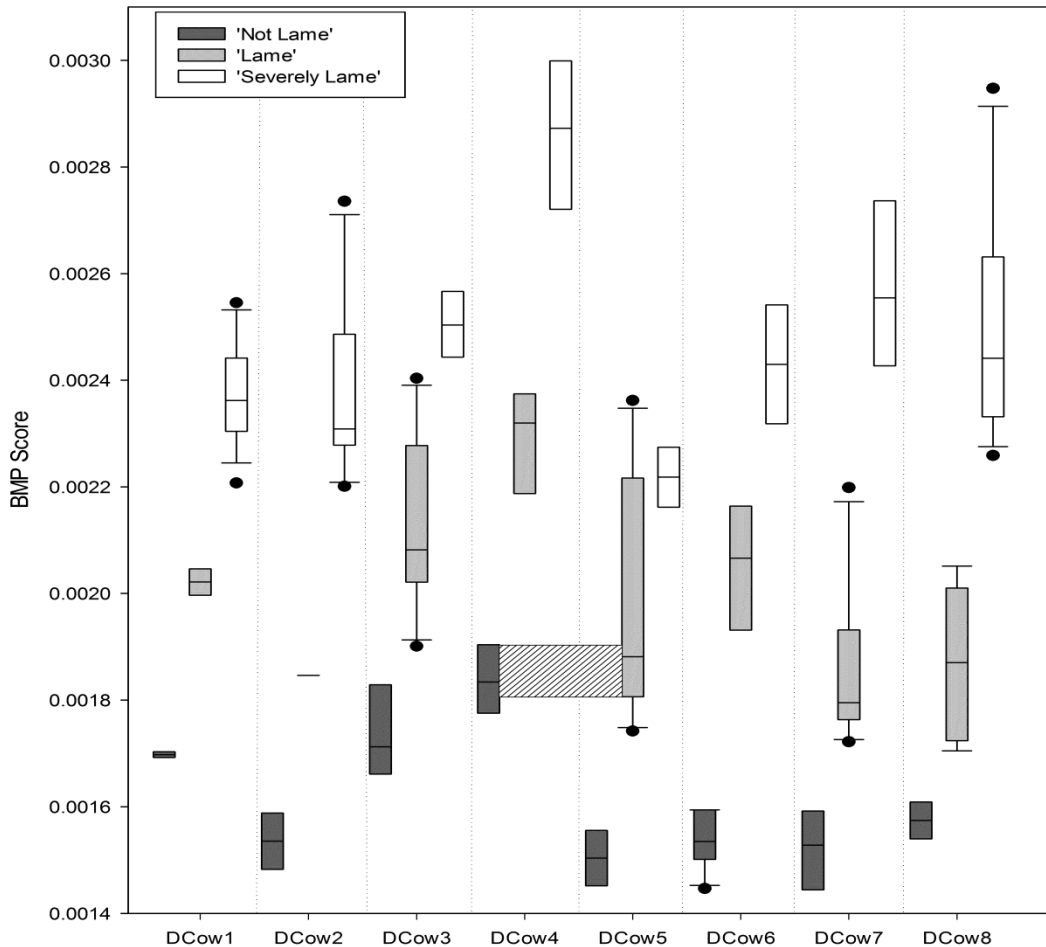
Feature variable: Back posture



Commercial farm layout: ground plan



Results: individual animals



Cow	True Positive Rate	False Positive Rate	Accuracy
1	0.93	0.01	0.93
2	0.89	0.22	0.89
3	0.86	0.11	0.86
4	0.91	0.05	0.91
5	1.00	0	1.0
6	1.00	0	1.0
7	0.86	0.08	0.86
8	0.88	0.05	0.88
Total	0.91	0.06	0.91

Dataset	True Positive Rate	False Positive Rate	Accuracy
Group	0.80	0.12	0.80
Individual	0.91	0.06	0.91

Individual threshold can increase the sensitivity of more than 10%

EU-PLF: Bright Farm by Precision Livestock Farming (EU-PLF)

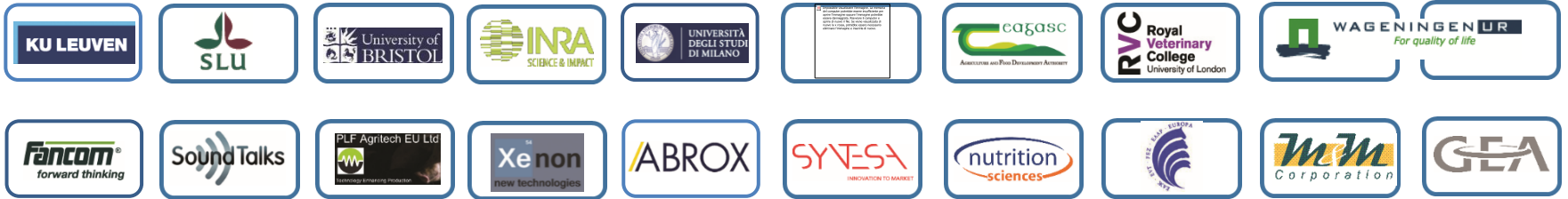


Objective: Develop a Blueprint on how to use PLF technology in the field

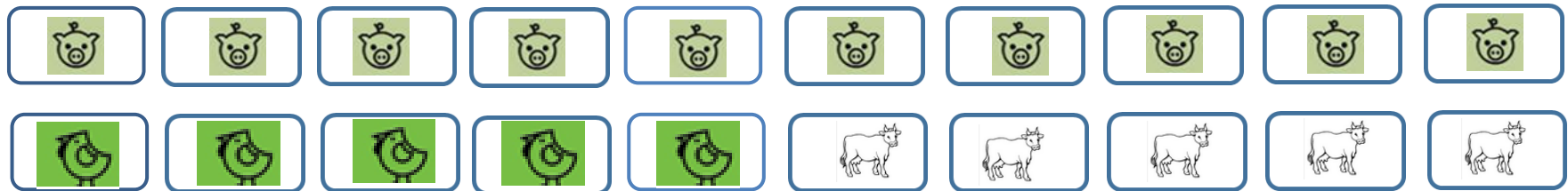
EU-PLF – Bright Farm by Precision Livestock Farming



EU-PLF Partners



EU-PLF Farmers



EU-PLF Advisory Board



Prof. Jos Metz

Prof. Noel Devisch

Prof. Leo den Hartog

Dr. Dieter Schillinger

Mr. I. Blanco-Traba

Location of EU-PLF farms

Poultry

- Colbers NL
- Speller UK
- Cal Xulic ESP
- The Poultry Side UK
- Lavarini IT

Pigs

- Teeuwen NL
- Granja Mir ESP
- Granja Llucanese ESP
- Dunahyb HU
- ~~(Karakai HU)~~
- Verhoijzen NL
- ~~McCrea N-IRL~~
- APC FR
- Bergot FR
- Merigo IT
- **Harry Heath UK**



Location of cow farms



INRA, Marcenat (France)
ARO (Israel)

Ladugaarden (Sweden)
Blæsbjerg (Denmark)
Nørupgaard (Denmark)
Steinmann (Germany)
Hulshof(The Netherlands)
Bos farm (The Netherlands)

RESULT: Farmer trainings (after farmers' workshop)

- 17 & 18 November 2014 @ Fancom
 - Poultry:
 - 4 farmers
 - 2 assessors
 - 7 EU-PLF partners
 - Pigs:
 - 7 farmers/representatives
 - 1 Assessor
 - 9 EU-PLF partners



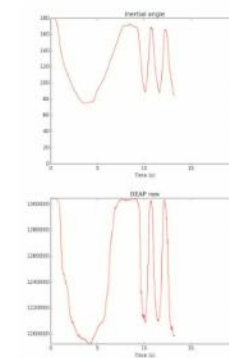
RESULT: Creation of new SME's



YMAGING, Barcelona

Pigwei product: weight measurement.
Patent pending.
Fast growing company.
New jobs: 10+.

Highly accurate push-up monitoring



Bainisha, Leuven

Project about a hyper-elastic self-adhesive smart patch, measuring the displacement of the joint-angles.
Patent pending.

Feedback from farmers

Workshop with Farmers

Copenhagen 2014

