# In-silico model of lifetime trajectories of dairy cows

***Commonly used acronym:*** *INSILICOW*

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### Organisation

**Name of the organisation** Katholieke Universiteit Leuven (KUL)

**Department** Department of Biosystems

**Country** Belgium

**Geographical Area** Flemish Region

**Name of the organisation** Institut national de la recherche agronomique (INRAE)

**Department** MoSAR

**Country** France


## SCOPE OF THE METHOD

| | |
|---|---|
| **The Method relates to** | Animal health |
| **The Method is situated in** | Basic Research, Translational - Applied Research |
| **Type of method** | In silico |

## DESCRIPTION

### Method keywords

dairy cow

white-box model

lifetime trajectory

reproduction

milk yield

modelling

simulation

### Scientific area keywords

Animal science
statistical modelling

### Method description

This white-box model uses energy partitioning throughout the lifetime of dairy animals (growth, lactation, gestation, ...) to simulate reproduction performance, lifetime length, production performance etc. The method is developed by dr. Olivier Martin at INRAE, MoSAR, Paris.

### Lab equipment

You need the model codes to work with them.

### Method status

History of use
Published in peer reviewed journal

## PROS, CONS & FUTURE POTENTIAL

### Advantages

Replaces costly animal trials,
Accurate outcomes if you put the right parameters in.

### Challenges

Parameter choice and identifiability

### Modifications

Further extensions and improvements are in constant course of development

### Future & Other applications

Simulation studies in dairy cows, for example for studying resilience and perturbations in milk yield, or reproduction progesterone profiles

## REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

### References

Adriaens I., Martin O., Saeys W., De Ketelaere B., Friggens N.C., Aernouts B. (2019). Validation of a novel milk progesterone-based tool to monitor luteolysis in dairy cows. Timing of the alerts and robustness against missing values. JOURNAL OF DAIRY SCIENCE, 102 (12), 11491-11503 doi:doi.org/10.1101/526095.

Martin O, Blavy P, Derks M, Friggens NC, Blanc F. (2019) Coupling a reproductive function model to a productive function model to simulate lifetime performance in dairy cows. Animal. 13(3):570-579.

### Links

Validation of a novel milk progesterone-based tool to monitor luteolysis in dai...

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