

## Vitamin E supplementation - revised recommendations for organic dairy cow production

### Problem

Vitamin E is essential, and supplementation to the diet is often needed to meet the requirements of cows. Current supplementation recommendations may be overestimated in forage-based systems where grazing or grass-clover silages are the basal diet, with low to moderate levels of concentrate feed.

### Solution

An update of the requirements and recommendations for vitamin E in organic dairy milk production is needed to explore the potential of reducing the supplementation level of vitamin E, thus reducing feed costs while ensuring animal health and welfare.

### Outcome

A systematic literature review was conducted to analyse the response to vitamin E supplementation, considering the animal's life stage and the composition of the basal diet. Based on that, RELACS was able to update the vitamin E supplementation recommendations for organic dairy cows.

### Applicability box

#### Input used

- |                                      |  |
|--------------------------------------|--|
| <input type="checkbox"/> Copper      | <input type="checkbox"/> Anthelmintics |
| <input type="checkbox"/> Mineral oil | <input type="checkbox"/> Antibiotics   |
| <input type="checkbox"/> Fertilisers | x Vitamins                             |

#### Geographical coverage

Europe

#### Application time

Whole year

#### Animal species/category

Dairy cows

#### Period of impact

Whole lifecycle period

#### Application point

Production of premixes and cow feed

#### Target

Feed safety; animal health and welfare

### Practical recommendations

- For organically managed dairy cows, vitamin E supplementation is needed in the transition period, i.e., the period from the end of gestation, calving and beginning of lactation.
- During the transition period, vitamin E supplementation should be higher if the basal diet is based on maize silage, hay or haylage, or whole crop silage than if it is based on pasture or grass-clover silage.
- Vitamin E supplementation is not needed after the first 30 days of lactation if the basal diet is pasture or high-quality grass-clover silage.
- The daily vitamin E supplementation recommendations for organic dairy cows according to the primary type of forage fed in the animal's diet are detailed in Table 1.
- These recommendations are valid if selenium intake is adequate and the concentrate proportion in the diet is in line with the organic production standards - i.e. less than 40% of the total dry matter intake on average across the lactation.

**Table 1: Vitamin E supplementation recommendations for organic dairy cows according to feeding system** (Source: Håvard Steinshamn, NIBIO)

	DMI, kg/day	Vitamin E supplementation, IU/kg DMI		
		Pasture	Grass-clover silage	Other preserved forages*
Gestating, last 30 days before calving	10	15	25	25
Lactating, < 30 days in lactation	15	15	15	25
Lactating, > 30 days in lactation	20	0	0	15

IU = international units  
DMI = dry matter intake  
\*Other preserved forages are hay, haylage, whole crop silage, maize silage



Picture 1 (left): Cows fed on preserved forage (René Schulte, BioSuisse)

Picture 2 (middle): Cows on pasture – a good source of vitamin E (Håvard Steinshamn, NIBIO)

Picture 3 (right): Farmer making round bale grass-clover silage (Åshild T Randby, NMBU)

## On-farm application

### System approach

- Providing animals with vitamins according to their needs is essential for their well-being and health. However, not supplementing more than the optimal level of vitamins aligns with the organic principles, aiming at being as independent as possible from external inputs.

### Evaluation

- The recommended supplementation is based on a literature review, surveys of vitamin E status on organic dairy farms, experiments with vitamin E supplementation conducted in organic dairy farms, and the diet of major organic dairy farming types in Europe.
- Regular evaluation of the animals must include monitoring of health and performance. Signals of vitamin E insufficiency include increased frequency of mastitis, retained placenta, decreased fertility and increased oxidative flavour of milk.

## Further information

### Weblinks

Check the [Farm Knowledge Platform](#) for more practical recommendations.

Check the authors [linked publication](#) for the full study.

## About this practice abstract and RELACS

### Publishers:

Research Institute of Organic Agriculture FiBL  
Ackerstrasse 113, Postfach 219, CH-5070 Frick  
Phone: +41 62 865 72 72, [info.suisse@fibl.org](mailto:info.suisse@fibl.org), [www.fibl.org](http://www.fibl.org)

IFOAM Organics Europe  
Rue du Commerce 124, BE-1000 Brussels  
Phone: +32 2 280 12 23, [info@organiceurope.bio](mailto:info@organiceurope.bio), [www.organiceurope.bio](http://www.organiceurope.bio)

Norwegian Institute of Bioeconomy Research (NIBIO)  
Postboks 115, NO-1431 Ås  
Phone: +47 406 04 100, [post@nibio.no](mailto:post@nibio.no), [www.nibio.no/en](http://www.nibio.no/en)

**Authors:** Håvard Steinshamn

**Editors:** Mathilde Calmels, Joelle Herforth-Rahmé, Florian Leiber, Lauren Dietemann, Bram Moeskops

**RELACS:** 'Replacement of Contentious Inputs in Organic Farming Systems' (RELACS) builds on results of previous research projects and takes far-advanced solutions forward. As a system approach to sustainable agriculture, organic farming aims to effectively manage ecological processes whilst lowering dependence on off-farm inputs. The RELACS partners will evaluate solutions to further reduce the use of external inputs and, if needed, develop and adopt cost-efficient and environmentally safe tools and technologies.

**Project website:** [www.relacs-project.eu](http://www.relacs-project.eu)

**Social media:** Facebook ([RELACSeu](#)) & Twitter ([@RELACSeu](#))

© 2022

