

Partnerships for sustainable dairy



- * Focus on farms
- * Best practices
- * Key interventions

The need for partnerships

Creating a sustainable dairy chain. That is the challenge Danone and Wageningen University & Research have taken on in their joint effort to support the global dairy sector. This brochure aims to help those involved to find their way towards more effective and productive partnerships for sustainability.

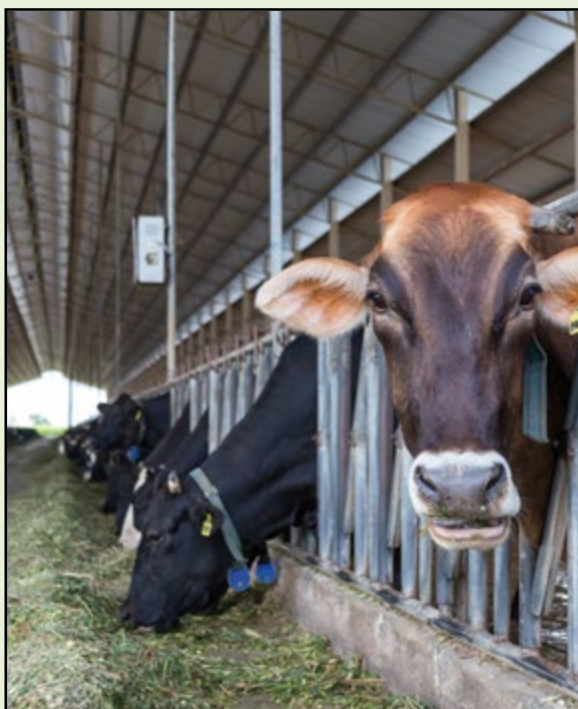
All partners – from farmers to processors to dairy associations - need to work together if we are to achieve a more sustainable dairy chain. We have explored the tools that can be used to get all partners in the dairy chain closer to their sustainability goals.

In this brochure you will find best practices and key interventions for a more sustainable dairy chain. The set of interventions and the methodology presented here, can also be used in other agricultural and food sectors.

“The sessions with Wageningen have provided us with a number of building blocks to build our own sustainability program. Some of these blocks seemed not relevant for us at that point, but now some time later we are actually implementing these blocks in our program.”

José Yagüe, Danone

Milk Quality & Sustainability Manager Iberia



Focus on the farm

Management practices on the farm are essential to the sustainability performance of the entire dairy chain. The dairy farm is the link in the chain with the biggest impact on the carbon footprint of milk. This is due not only to milk production on the dairy farm, but also to the related production of feed and fertiliser. If we want to move towards a more sustainable dairy chain, we need to focus on the farm and the farmer.

Two questions are essential:

1. What are the best practices for dairy farming?
2. How can we help farmers divert towards these best practices?

Defining best practices

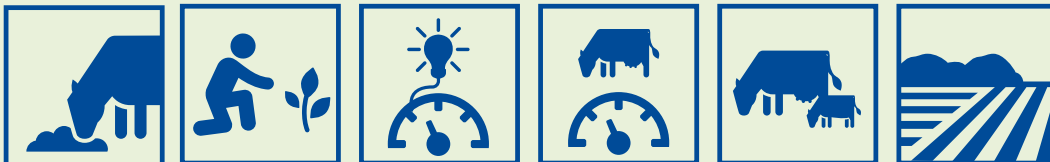
The diversity among dairy farms is huge. This means it is impossible to come up with a one-size-fits-all solution to improve sustainability. Best practices are not the same for every farmer or suited to every farm. We brought experts together to come up with best practices for reducing carbon footprint and improving animal welfare on different types of dairy farms. For each best practice we have defined the expected impact on sustainability and have tried to

determine the efforts and costs needed for implementation.

In this brochure you will find separate worksheets with best practices for both animal welfare and the reduction of the carbon footprint of dairy farms. These worksheets can be used to discuss the options with individual farmers. Ultimately, it is up to the farmer to decide which practices best fit him and his farm.

Best practices for:

Greenhouse gasses



Animal welfare



“On animal welfare we started a few years ago in Spain with assessing farms and educating the farmers. Quite a big group of farmers have already improved. Through benchmarking and comparing results with colleagues and providing tailor made and easy to implement practices we try to add other incentives to make farmers move.”

*José Yagüe, Danone
Milk Quality & Sustainability Manager Iberia*

Step 0

Know your goals



Know or define the sustainability goals your organisation wants to achieve. Why do you want to move towards a more sustainable dairy chain?

Make sure you get your story straight before you start. And what is it you want to achieve?

Step 1

Know your farmers



We need all hands on deck to achieve our goals, meaning all supplying farmers, including those who might not be ready to change yet.

It is essential to know what kind of farmer you are talking to. What is his mindset towards sustainability?

What kind of incentives does this farmer respond to? How can you support him to change?

Farmers will have many questions about the implications of new practices. Start the conversation on sustainability sooner rather than later!

Step 2

Know your interventions



Change is never easy. Different types of farmers will respond to different interventions. Some farmers will adopt new practices based on results from research. Other farmers may develop this knowledge by themselves.

Others still, will sooner respond to a premium, a subsidy or even regulations and contracts. In order to be successful at creating a more sustainable dairy chain, a full spectrum of incentives and interventions is needed to reach all farmers.

Step 3

Organise change



To achieve your goals a number of actions can be taken. First of all, you can provide knowledge. This can be done in several ways: demonstrations, expositions, assessment tools and benchmarking can all help in this respect. Another possibility is to put minimum standards in contracts or to pay for a certain performance.

The most appropriate interventions differ between target groups and will vary in impact and time needed. A set of eight key interventions has been made available. You can find these interventions, their corresponding target groups, impact and requirements in the separate worksheet.

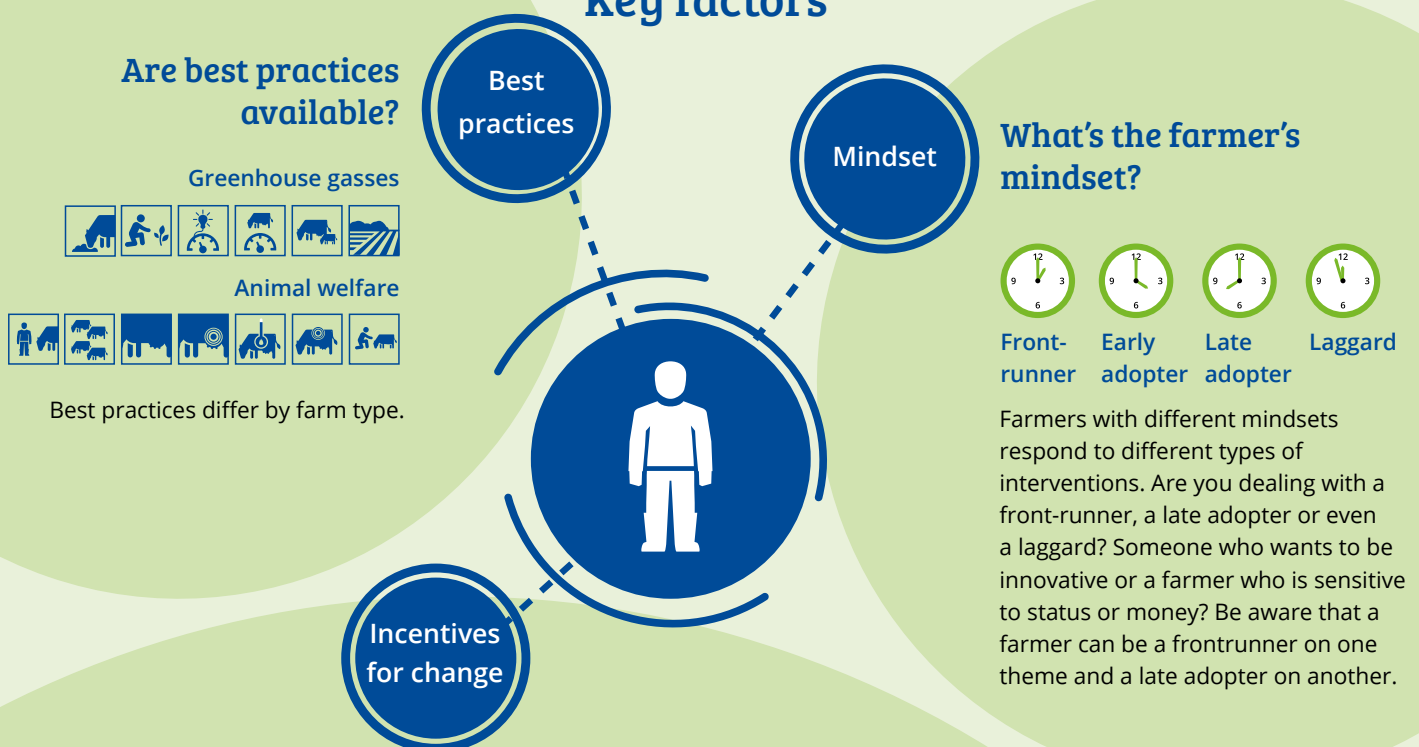
Organising change: interventions



A number of interventions are available to help you achieve a more sustainable dairy chain. First of all, you can provide knowledge. This can be done in several ways: demonstrations, expositions, assessment tools and benchmarking can all help in this respect. Another possibility is to put minimum standards in contracts or to pay for a certain performance.

Each type of intervention requires specific skills within the organisation and requires a certain budget. Different types of farmers will be addressed by different types of interventions. The interventions differ in their degree of impact and in the time needed before impact will actually show.

Key factors



Which incentives encourage farmers to change?

Type of incentive	R	E	S	E	T
	Regulations	Education	Social pressure*	Economic incentives	Tools**
Mindset of farmer	Applies to all farmers, is appreciated by farmers that look for clear guidelines and often needed for laggards.	Good fit for information seekers, independent farmers who want to understand the background to sustainability measures and who make the final decision for their own farms. Suitable to early adopters.	Fits with status seekers, important for a large group of farmers, especially for late adopters.	Farmers who focus on return on investment, price-conscious farmers.	Farmers that are looking for convenience, suitable for late adopters.

*Social pressure (related to what is considered 'normal' by your peers) is an important contributor to change of behaviour. It can also be an important blockade for changing behaviour.

**Tools make the desired behaviour easier to execute, for instance easy-to-use turnkey solutions.

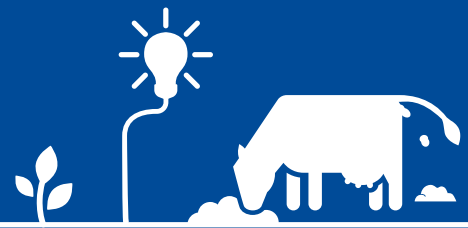
[Learn more about 8 key interventions >>](#)

Eight key interventions to improve sustainability on dairy farms

Intervention	Description	Target group	Impact	Requirements
Innovation	Individual farmers or farmer networks working on new solutions.	Frontrunners	New best practices.	Access to knowledge and funding.
Learning by seeing E S	Open days, excursions, showcase farms.	Early adopters	Connection to other farmers, buyers and society at large.	Showcase farm which has good results but is also considered 'normal'.
Individual learning by farm-specific assessment E	Assessment tools, audits, individual data analysis, benchmarking and measures at farm-level.	Early adopters	Individual plan for improvement based on farm-specific data and analysis.	Good quality of farm-specific data. Knowledge needs to be provided through tools, experts, advisers or colleagues.
Group learning with expert input E S	Group with facilitators, experts, workshops and discussion.	Early adopters	Workshops to create awareness and motivation. Discussion groups (minimum 3 meetings) using data from participants to compare and learn from each other.	Workshops are best carried out on-site at an exemplary farm, showing best practices. Discussion groups thrive when data and a good facilitator are available, and when farmers are willing to share data and practices.
Communication & network E S	Meetings, magazines, newsletters, competitions, including communication with vets and farm advisers.	Early and late adopters	Creates awareness and sets the standard.	Communication plan with clear focus on relevant target groups and aimed at shifting habits and norms.
Financial incentives E	Financial reward for participating in activities, implementing best practices or achieving a certain performance.	Early and late adopters	Payments can be made for specific measures or actions at farms. Alternatively, a scoring system can be set up where measures or a specific performance can lead to a premium.	Reliable way to quantify best practices and / or performance of individual farmers.
Making it easy E T	Tools such as turnkey solutions or (free) access to experts.	Late adopters	Adoption of standard best practices by larger group of farmers.	Easy access to turnkey solutions and tools. Provide access to individual advice, using quality advisers that abide by buyer's strategy.
Change by contract R S	Minimum standards, contract terms, audits, regulations.	Laggards	Minimum standards are met, this intervention may put pressure on relationship with farmers.	Exit strategy needed in case farmers do not comply.



Greenhouse gasses



The production of greenhouse gasses by industrial sectors, transport, households and agriculture causes global warming. This will have impacts on climate, sea level rise, nature and human health. In many cases this will be a negative impact. This is why actors in the global dairy sector make plans to decrease the emissions of these gasses.

Best practices

On this worksheet you can find so-called 'best practices' that will contribute to the reduction of greenhouse gas emissions on dairy farms. Only best practices with a positive or neutral impact on the profitability of the farm have been included in the suggestions below.

How to apply best practices

All best practices on this worksheet are used in different parts of the world. But it is not always easy to apply them in an effective and profitable way. In many cases this will require training,

demonstrations on regional farms, experience on individual farms and perhaps incentives from the dairy processor and/or government authorities.

Feeding



Feeding is a very important contributor to greenhouse gas emissions on the dairy farm. About 40% of the greenhouse gas emissions on a dairy farm come from methane produced by the rumen and the intestines of the cows. And about 30% of the emissions are connected to the production and transport of feed acquired by the farmer from feed manufacturers or crop farmers.

Best Practice	Impact on	
	GHG	€
Optimise rations (match with requirements)	++	++
Reduce losses during storage	++	+
Optimise feed quality and composition	++	+
Avoid excess protein feeding	++	+
Direct feeding of compound ingredients	+	+
Offer unlimited access to drinking water	+	+

Feed production on farm



Many farms use fertilizers for feed production. Producing these fertilizers requires a lot of energy. This means that reducing fertilizer use and being more efficient contributes to emission reduction. A higher production of feed crops per hectare will also reduce the need to buy feed externally, thus reducing emissions caused by transport. Grazing cows instead of feeding silage also saves on costs for transport and harvest.

Best Practice	Impact on	
	GHG	€
Increase feed value of crops	+++	+
Improve grazing management	+++	+
Optimise fertilization	++	+

Greenhouse gasses - Best practices

Herd management



Healthy cows and young stock produce more efficiently and live longer. Increasing the share of productive animals also contributes to emission reduction and higher profitability

Best Practice	Impact on	
	GHG	€
Reduce replacement rate by increased longevity	+++	++
Reduce idle cows	+++	++
Decrease age of first calving	+++	+
Improve health management	++	+
Optimise transition period	++	+
Optimise young stock management	++	+

Breeding



Genetics can contribute to improved efficiency in the long run.

Best Practice	Impact on	
	GHG	€
Improve genetics to increase feed efficiency	+	+
Improve genetics to increase production	+	+

Energy management



All farm practices that save energy help to reduce emissions. In many cases it is a matter of smarter use of machines and installations. In some cases new energy-saving techniques for milking, cooling or cultivation may be necessary.

Best Practice	Impact on	
	GHG	€
Production of green energy (wind, solar and manure digestion)	++	+
Apply energy-saving technologies	+	+
Optimise use of energy	+	+
Optimise use of machinery	+	+
Select crops with low need of machinery use	+	++
Apply more grazing	+	+

Carbon sequestration in soil



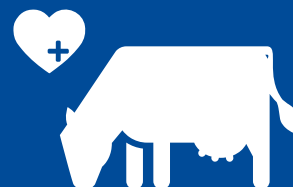
Increasing the organic matter content of the soil improves soil fertility and water storage capacity. At the same time, a higher organic matter content in the soil captures carbon from the air. To achieve this, less cultivation and good management of the soil and permanent grassland is required.

Best Practice	Impact on	
	GHG	€
Avoid soil compaction	+	○
Apply permanent soil cover by crops or mulching	+	○
Apply no-tillage on permanent grassland	+	○
Apply reduced tillage on crops	+	○
Reduce renewal rate of grassland	+	○

Innovative ways to reduce emissions

All best practices presented here, are ready-to-use on dairy farms. More innovation is under way as researchers from all over the world are developing new practices. Examples are: avoiding the use of soy to diminish transport distances, introducing new crops that will produce more protein per hectare, the use of fertilisers that cause less emissions during produc-

tion and after application in the field, making feed additives that reduce methane production from enteric fermentation, devising methods to capture methane and to increase the sequestration of carbon in the soil. In all these experiments it is important that new practices are both effective at reducing emissions as well as cost-effective for farmers.



Animal welfare

Animal welfare has a major impact on the health and production capacity of cattle. This is one reason why dairy farmers and advisors (e.g. veterinarians) work on improving animal welfare. Also, standards and norms on animal welfare are continuously changing. Customers who consume dairy products, processors and retailers are raising standards and aim to improve animal welfare.

How high the standards for animal welfare in the market are, depends very much on regional norms.

Best practices

On this worksheet you will find so-called best practices that contribute to the improvement of animal welfare on dairy farms. Only best practices with a positive or neutral impact on the profitability of the farm have been included in the suggestions below.

How to apply best practices

All best practices on this worksheet are used in different parts of the world. But it is not always easy to apply them in an effective and profitable way. In many cases this will require training,

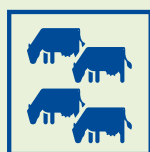
demonstrations on regional farms, experience on individual farms and perhaps incentives from the dairy processor and/or government authorities.

Stockmanship



A better understanding of cattle behaviour, and experience with animal handling is key in working with cattle. It diminishes stress of the animals and creates a safer environment for staff. Knowledge of existing legislation on animal welfare, pain management and internal farm standards on handling cattle can also help to improve animal welfare.

Stocking density



Room to move around, to lay down and to eat and drink is an important condition for health and longevity in cows. The most important action to achieve this is providing more room to the animals. It allows them to express their natural behaviour.

Best Practice	Impact on	
	Welfare	€
Organise training on stockmanship for farm staff	+++	++
Introduce and maintain standards for working with animals	++	+

Best Practice	Impact on	
	Welfare	€
Avoid overstocking: no more than one cow per stall	+++	+
Provide 70 cm feed bunk space per cow (for dry cows 85 cm)	+++	++
Provide 10 m ² per cow (for lying) excluding feed alley	+++	+
Provide pasture access for grazing	+++	○
Push up feed frequently (at least 4 times a day)	+	+

○ No impact + Low ++ Average +++ High

Recording and monitoring essential to timely intervention

Workers on a dairy farm have an important role in observing abnormalities in animal behaviour. This is important to identify cows that are sick, wounded or stressed. Recording systems to monitor animal welfare and health of the animals can also be used. In many parts of the world one or more of the recording systems mentioned here, are available to support farm staff.

Feet and legs	Locomotion score: by observation
	Lying time recording: by sensor measuring
	Foot and leg disorder prevalence: by recording after observation and during hoof trimming
Mastitis	Somatic cell count: by laboratory testing
	Teat end scores: by observation
Heat stress	Temperature measurement in buildings
General	Activity recording: by pedometers
	Body condition score: by observation
	Disease prevalence: by recording after observation
	Treatments: by recording after treatment

Animal welfare - Best practices

Feet and legs



Certain housing systems and high production levels, may put pressure on the locomotive system of cows, resulting in lameness. Preventative measures and timely treatment of cows with feet and leg problems are the main solutions.

Best Practice	Impact on	
	Welfare	€
Trim hoofs on a regular basis (also prevention)	+++	+++
Provide soft and dry bedding material in stalls and pens	+++	+
Use rubber flooring in alleys	+++	+
Implement free access to exercise area	+++	○
Use foot baths against claw infections	++	++

Mastitis



Mastitis infections are contagious, painful for the cow, costly and a hassle for the farmer. All kinds of prevention measures, early detection of infected teats and appropriate treatment are important.

Best Practice	Impact on	
	Welfare	€
Provide hygienic housing conditions (clean stalls, alleys, feed and water troughs)	+++	+++
Implement protocol for detection, diagnosis and treatment of mastitis	+++	+++
Feed according to body condition and transition management standards	+++	+++
Implement protocol for dry cow therapy	++	+++
Implement well-defined milking protocol	++	++
Application of hygiene measures by milker (desinfected hands, gloves)	++	++
Select sires for good udder conformation	+	++

Heat stress



Heat stress in cows results from a combination of uncomfortable temperatures and humidity levels. The higher both are, the bigger the risk of heat stress. Heat stress can already develop when temperatures rise above 20 degrees Celsius, combined with a relative humidity above 75%. Ventilation and cooling are the main preventative actions.

Best Practice	Impact on	
	Welfare	€
Install active cooling systems (fans, sprinklers and showers)	+++	+++
Provide shadow in exercise area and pasture	+++	++
Isolate roof of building	++	++
Adjust feed ration in times of heat stress	++	++
Provide 10 cm water through space per cow or one drinker per 10 cows	++	+
Adapt breed of cows and breeding goal to climate	++	○

Mutilations



Mutilations usually hinder natural behaviour. Lowering stocking density can pave the way for reducing mutilations. Handling cows in a way which causes minimal pain, is also part of the best practices in this group.

Best Practice	Impact on	
	Welfare	€
Apply disbudding of calves before age of 8 weeks	+++	++
Stop mutilations (dehorning adult cows and tail docking)	+++	+
Use anesthetics and pain killers when disbudding	+++	+
Shift to polled sires and/or breeds	+++	○
Train workers on how to treat cows and how to apply medications	+	++

Raising young stock



All of the above best practices also apply to calves, with the exception of the ones relating to mastitis. Housing of calves deserves extra attention because it often differs from dairy cow housing.

Best Practice	Impact on	
	Welfare	€
Provide soft and dry bedding material in stalls and pens	+++	+++
Provide group housing for calves within two weeks after birth	+++	++



Creating a sustainable dairy chain. That is the challenge Danone and Wageningen University & Research have taken on in their joint effort to support the global dairy sector. We believe that if we can increase sustainability, producers, processors and consumers will benefit. This brochure offers best practices and key interventions to support a sustainable dairy chain.

Colofon

Authors

- Jelle Zijlstra (Wageningen Livestock Research),
jelle.zijlstra@wur.nl
- Alfons Beldman (Wageningen Economic Research),
alfons.beldman@wur.nl
- Cees Jan Hollander (Danone)
ceesjan.hollander@danone.com

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