NDA Germany

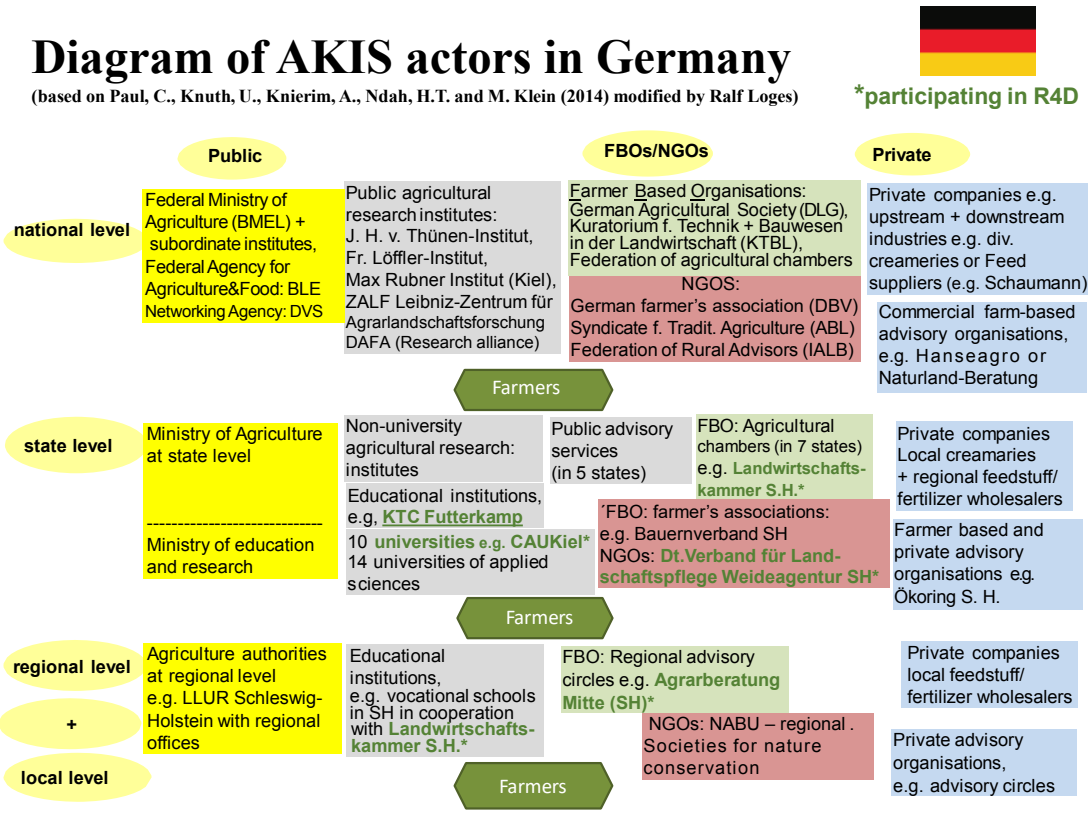

Figure 16. Dairy Agricultural Knowledge & Information System (AKIS) in Germany based on Paul, C., Knuth, U., Knierim, A., Ndah, H.T. and M. Klein (2014) modified by Ralf Loges
original: https://430a.uni-hohenheim.de/please-change-url-alias-114438429

In R4D the Region of Schleswig-Holstein (Germany) has formed a project specific regional dairy AKIS that consists of 20 members (Figure 17):

- 11 pilot farms
- 2 advisory service institution:
  - a) Agrar-Beratung Mitte
  - b) Agrar-Beratung-Nord
- 2 research institutions:
  - a) University of Kiel
    - a1) Chair of Grass and Forage Production
    - a2) Chair of Organic Farming and Low-Input Farming Systems
    - a3) Chair of Animal Nutrition)
  - b) Wageningen University & Research (Department of Animal Sciences/Animal Production Systems)
- 1 farmer-based organisation: Chamber of agriculture Schleswig-Holstein (LK SH)
- 1 dairy company: DMK
- 1 governmental institution: Ministerium für, Landwirtschaft, Umwelt, Natur und Digitalisierung (Schleswig-Holstein Ministry of Agriculture, Environment, Nature and Digitalization)

- 1 non governmental organisation: Deutscher Verband für Landschaftspflege e.V. German Association for Landscape Maintenance (DVL)
- 1 Innovation-transfer organisation: Schleswig-Holstein Innovation office EIP-Agrar: coordinating 13 EIP-Operational-groups with focus on dairy

Figure 17. The regional dairy AKIS of Schleswig-Holstein (Germany) consists of 11 pilot farms and 9 non-farmer institutions each with their own expertise.

Below, each member is described in more detail.

Pilot farms

The eleven pilot farms are spread over Germany and are depicted in Figure 18.

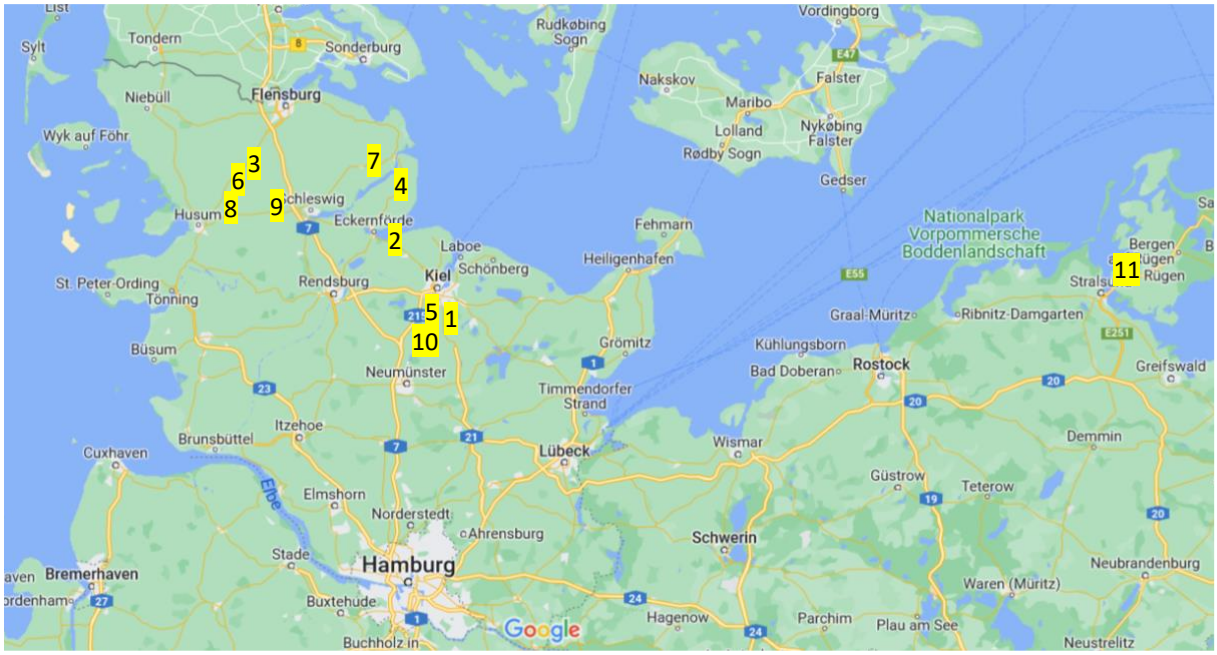

Figure 18. Location of the 11 pilot farms in Northern Germany (Schleswig-Holstein and Mecklenburg Vorpommern) The background map is Google Maps © 2009 with mapdetails of 2022 Geobasis DE/BKD.

1. Jörg Riecken (Großbarkau)
   - Volume of milk production:
     1.460.000 litres per year
   - Dairy cows:
     140 high yielding Holstein cows
   - Reason to include this farm:
     Young farmer, very efficient farm, newly build cow comfort-barn with cubicles, cost efficient feeding: quality grazing in combination with autumn block-calving, actual building up infrastructure for milking-robots in combination with rotational ABC-Grazing-system.
2. Lindhof (Noer)
   - Volume of milk production:
     760.000 litres per year
   - Dairy cows:
     110 spring calving Jersey and crossbreed cows
   - Reason to include this farm:
     Eco-efficient milk production: full grazing, organic, low rate of concentrates, extremely low product carbon-footprint for milk production through maximization of grazing, high productive lifespan of cows. Organic mixed farming low external inputs, very, high biodiversity through multispecies swards. High animal welfare: newly build cow comfort-barn loose housing on own straw.
3. Christian Cordes (Wanderup)
   - Volume of milk production:
     1.860.000 litres per year
   - Dairy cows:
     200 high yielding Holstein cows

- Reason to include this farm:
  Very efficient farm, Cost efficient feeding: quality grazing in combination with autumn block-calving, re-introduction of sugar beets as energy rich forage to reduce concentrate feeding, recycling of animal manure in an efficient biogas-power plant. Certified animal welfare milk production achieving higher milk prices, all heifer calves are raised by nurse-cows.

4. Andreas Hobus (Kappeln)
   - Volume of milk production:
     1.860.000 litres per year
   - Dairy cows:
     200 high yielding Holstein cows
   - Reason to include this farm:
     A very divers mixed farm, generating income in various ways, optimised nutrient flows by co-operation with an all-arable farm as neighbour. Wide spectra of forage crops, permanent grassland, high-cut silage maize, grass and grass-clover leys in an expanded crop rotation. Reintroduction of red and white clover to save mineral Nitrogen fertilizers and to improve protein-self-sufficiency. Slurry, manure and rejected feedstuff is used for energy production in a biogas plant of adequate size. Selling milk and other farm products with self-vending machines 24/7.
5. Kherstin & Bert Riecken - rieckens landmilch GmbH (Großbarkau)
   - Volume of milk production:
     560.000 litres per year
   - Dairy cows:
     70 grazing based Holstein cows
   - Reason to include this farm:
     A diverse organic mixed farm, generating income in various ways. All milk from 70 Cows is self-processed in the farm creamery, sold via delivery services or in the farm shop, also processed beef is sold there. Optimised rotational grazing system to produce extreme high-quality grass. In 2021 an Agroforestry project was established by planting 1500 trees, for carbon sequestration, production of timber, but also fruit and leaves to be grazed by the cows, the trees will in future also offer shadow for the grazing animals. The generation change to their children is imminent.
6. Kirsten Wosnitza und Gerd-Matthias Albertsen (Löwenstedt)
   - Volume of milk production:
     1.310.000 litres per year
   - Dairy cows:
     140 high yielding Holstein cows
   - Reason to include this farm:
     Very efficient farm, very healthy animals, very high longevity of cows. Cost efficient feeding: quality grazing in combination with autumn block-calving. Using constantly stocked short grass grazing < 5 cm growing height, this allows for extremely high forage quality and a reduced workload, so the couple of Kirsten and Gerd can manage the farm independently of external workers and on top find the time to engage them in farmers unions and put a lot of energy in their blog making the urban societies understand, what real farming is challenged with and show their farms animal welfare, producing milk with healthy and happy cows.

7. Dirk and Nis Petersen (Scheggerot)
    - Volume of milk production:
      1.260.000 litres per year
    - Dairy cows:
      135 high yielding grazing-based cows of Angeln breed
    - Reason to include this farm:
      Preservation of an old regional breed of cattle: Red Angeln Cattle (sub family of Scandinavian red) Very efficient farm, extreme high longevity of cows (Several cows producing more than 100.000 kg Milk per cow). Cost efficient feeding: quality grazing in combination with autumn block-calving. Using fast rotational grazing at < 5 cm growing height, this allows for extremely high forage quality and a reduced workload. 1.5 workers to manage 135 cows. The farm has an extremely low carbon-footprint for milk, Angeln cattle is a dual-purpose breed producing milk rich in fat and protein, but more beef compared to Holstein-Frisian or Jerseys. Farm management takes much care of biodiversity with respect to field birds and amphibians. The generation change from Dirk to Nis is imminent.
8. Hanno and Max Lammers (Winnert)
    - Volume of milk production:
      1.310.000 litres per year
    - Dairy cows:
      140 high yielding grazing-based Holstein cows
    - Reason to include this farm:
      Very efficient mixed farm, Nitrogen use efficiency is high, slurry from dairy cattle is used for arable crops. One of Germany's longest traditions constantly stocked short grass grazing < 5 cm growing height, this allows for extremely high forage quality and a reduced workload. The grazing platform is restricted, stocking rate and average yields have increased, so the farm has decided to shift from compact spring to compact autumn calving to utilise the genetic potential of the cows better. Hanno is a young farmer the farm is designed so that he together with his since several years retired father can manage the whole farm alone and mostly independent from external help. External help comes from cooperation with neighbour farms, were they help each other e.g. at silage harvest.
9. Bent Jensen-Nissen - Olaf Jürgensen GBR (Jübek)
    - Volume of milk production:
      4.065.000 litres per year
    - Dairy cows:
      380 high yielding Holstein cows
    - Reason to include this farm:
      Very efficient farm, Cost degression by size, 2 Farmers merged farms, to become more efficient and to allow family life. Investment into a biogas power plant together with 4 further farmers to make use of slurry, solid manure and surplus silage, Slurry separation to use as basic bedding material with the aim to replace purchased straw.
10. Jan Danker (Brügge)
    - Volume of milk production:
      4.250.000 litres per year
    - Dairy cows:
      430 high yielding Holstein cows

- Reason to include this farm:
  Young farmer, very efficient farm, Cost degression by size, modern equipment for efficient all year-indoors milk production, very high animal health. Very good example of growth in an area in a region where land prices are high.

11. Alex Vömel (Rügen)
    - Volume of milk production:
      401.000 litres per year
    - Dairy cows:
      500 high yielding Holstein cows
    - Reason to include this farm:
      Large scale mixed farm, very efficient farm, cost degression by size, modern equipment for efficient all year-indoors milk production, very high animal health. Slurry is optimal utilised in large scale cash crop cereal production. The generation change is imminent.

EIP Operational groups in which the listed pilot farmers are involved.

1. **Pasture manager Schleswig-Holstein**
   The aim of the project is to increase the efficiency of gazing-based farms in Schleswig-Holstein through progress in pasture management. For this purpose, the GPS-steered Rising Plate Meter, "Grasshopper" and it's Grazing management as Decision-Support System are to be transferred to (North) German conditions with the support of Irish colleagues.

2. **Udder health - Development of a practical tool for farmers and consulting specialists to support farm-specific udder health strategies**
   Udder diseases, which are very common in dairy herds, impair animal welfare, are costly, and are the main reason for antibiotic use in the cowshed. The basis for improving and maintaining good herd udder health is a strategic and systematic approach. Prevention plays a crucial role, especially in organic dairy farms. All decisions regarding preventive measures in management, husbandry, and feeding, as well as for the treatment of the individual animals, should be as efficient as possible and adapted to the respective situation.

3. **Nutrient-efficiency grassland - Nutrient-efficient land concepts for grassland sites**
   The aim of the project is the development of digitally based land management concepts for typical grassland sites in Schleswig-Holstein. For the first time, area-based soil, crop, and yield data are collected, put together, and used for the development of a digital land management concept. For example, the direct connection between the currently prevailing soil properties, the plant stand, and selected yield and quality parameters on actual sites is established. Another element of the work is the assessment of the soil compaction status of grassland areas for the development of site-specific and intensity-specific inspection concepts. After evaluating the collected data, management measures will be developed that are adapted to individual plots or sites at the respective location. From this, fertilization intensities adapted for the area can be derived and plant stands developed accordingly via targeted measures. Through application-oriented scientific research, valid data and new insights for resource-efficient grassland management in SH will be generated, tested on farms, and later transferred to practice and agricultural consultancy.

4. **Cow-dependent calf rearing**
   The aim of the project is the development of a tool that supports milk producers both in the

introduction and in the further development of the process of "cow-calf systems" on their own farm. A set of guidelines and a consulting tool are planned to support the establishment of a cow-calf systems. Through accompanying data acquisition and evaluation in agricultural practice, the effects of cow-calf systems on calf and cow health will be investigated. The insights gained in the project (farm surveys, scientific analyses, stable school discussions) will be edited and summarized in a structured set of guidelines. The prototype of the guidelines will be tested, evaluated, and improved by the businesses involved. After completing and supplementing the guidelines, the final version will be prepared, published, and made available as an online tool. In addition, a homepage will be created that serves as a platform for all those interested in learning about and exchanging information about rearing using "cow-calf systems".

5. **Rough-stalked Meadow Grass Development of an online tool to prevent the immigration of unwanted species such as the rough-stalked meadow grass**
   The aim of the project is the development of site-adapted strategies for the prevention or control of rough meadow grass, which is the cause of low yields and forage quality in grassland. Following a status quo survey, the project will test measures on farms to control rough meadow grass in the landscapes of Marsch, Geest, and Östliches Hügelland. In addition, an experiment is planned to record the competitive strength of different grass species and mixtures compared to rough meadow grass. At the end of the project, the current status of the spread of rough meadow grass will be known, the drivers of the spread identified, and effective prevention and control strategies derived. These results will feed into the development of a free online tool for farmers that estimates the dispersal risk of rough meadow grass and proposes preventative and control measures, as well as competitive grass mixtures for reseeding.

6. **Animal welfare check cattle - Development of an animal welfare assessment tool based on selected indicators for Schleswig-Holstein dairy farms**
   The aim of the project is to provide a practical instrument for rapid and regular analysis of animal welfare on dairy farms. This instrument can be used to document and carry out the statutory self-inspection of businesses. How do we measure animal welfare? Both farmers themselves and politicians want a standardized assessment of the animal welfare situation on Schleswig-Holstein dairy cattle farms. With data from the LKV, the RSH eG and HIT, many indicators are already available that allow a largely automatically generated, standardized, and comparable presentation of the animal welfare situation. They are to be merged for the first time in this project. Timely and regular evaluation of these data will allow farmers to make objective assessments of animal welfare on their farms, without any major additional costs.

7. **InnoBau - Sustainable Innovations in Agricultural Construction**
   The process of intensive planning is based on assessment criteria and sub-criteria for sustainable animal housing systems, which were only applied in an elective module in the department agricultural studies at the University of Applied Science Kiel. Novel ideas for animal housing systems should be assessed in practice to ecological, economic and social sustainability already during the planning phase. The aim of the OG ' InnoBau ' is to support sustainable innovation in agricultural construction with a new, systematic decision-making process. For this, the group develop and test with participating companies from Schleswig-

Holstein, Germany, a tool for a systematic planning management, which is suitable in practice.

8. **InnoMelk Development of an innovative, technology-based analysis tool to facilitate animal-friendly milking**
   The optimal adjustment and regular review of the function, setting and equipment of milking systems and knowledge about their effect on udder health and milk production have a direct impact on the welfare and health of animals. The project is focused on developing and evaluating a sound analysis tool to support farmers in identifying the weaknesses of milking systems. The OG's (operational group) goal is to develop an innovative, technology-based analysis tool (electronic analysis tool, e.g. for smartphones or iPads) to highlight weaknesses in milking systems through a bottom-up process, in conjunction with those involved in the OG. This can then be used by everyone to comprehensively assess milking systems, produce a weakness analysis and use this to derive practical measures for action that can be implemented directly.

9. **Milk Feed & Feeding Sustainable N efficient GMO-free feeding on dairy farms in Schleswig-Holstein**
   The feeding of Schleswig-Holstein dairy cows is constantly calculated and optimized by specialized advisors and experts of feed suppliers. A question that arises when implementing diets with reduced protein content but not yet answered and analyzed is: How much protein requires the dairy cow really or how can we make the feeding more N-efficient? The OG Milk - feed & feeding aims with the innovation project to contribute to the efficient use of protein feed for dairy cows. The reduction of protein content in the total ration leads to decreased nitrogen excretion via the liquid manure and therefore to a reduction of nitrate loads from animal excrement into the environment. of this project should also increasingly come from native production to guarantee a GMO-free feeding for the consumers.

10. **Optimized Pasture Management-smart grazing**
    The feeding basis of milk production has dramatically changed in SH and nationwide in the last decades. The grazing of dairy cattle has been increasingly replaced by intensive livestock housing with feeding of grass- and maize silage and concentrated feed. As a consequence, there lacks a well-founded and scientifically sound data basis for assessing pasture services in SH. The OG " Optimized pasture management - smart grazing " has set itself the goal to close this data gap and to correct existing deficiencies in pasture expertise in the country.

11. **Homegrown Protein Crops**
    Development of a concept for the economic feeding use of grain legumes for dairy cows, beef cattle, pigs and chicken in Schleswig-Holstein in organic and conventional farming. The cultivation of combine harvestable large grain legumes can help to reduce cost for concentrate feeding, getting less dependent on protein and nitrogen-fertilizer import. The aim of the project is to promote the use of domestic grain legumes and significantly expand the area under cultivation in Schleswig-Holstein. Cultivation of broad bean is the focus of this project. The development of the technological process for heat treatment of broad beans to increase the feed value on the farm (use of stationary operating or mobile solutions by contractors) is tested in feeding trials with different animal species.

12. **Animal Genetic Resources**
    Old and typical regional breeds of domestic animals (Red & White Dual Purpose (The original Red Holstein) Cattle, Angeln Cattle (one of the basic breeds for Scandinavian Red) White Headed Mutton Sheep, German Improved White Goat, Angler Saddleback Pig and Schleswig Coldblood Horse) are threatened in their existence and extremely vulnerable. They are an important part of the biodiversity of our domestic breeds. The Operational Group "Animal Genetic Resources" is focussed on the avoidance of inbreeding and to promote the breeding progress of these breeds using modern genome-based population management methods. In this project pedigree analysis are performed and genome-based population parameters are estimated. Subsequently, an analysis to estimate potential foreign blood percentage is undertaken for Red & White Dual Purpose and Anglen cattle. Sequence analysis also are performed. As a target, the Operational Group develops a mating tool for farmers and hence contribute to the increasing of herd book stocks.

13. **Future strategies for the animal genetic resource Angeln cattle**
    The project "Future strategies for the animal genetic resource Angeln cattle - animal welfare, nutrient and climate efficiency" has the aim of expansion of herd typing within the Angeln breed, a status quo survey of the status of digitization/animal health and genome-wide association studies in the areas of animal welfare/animal health, climate and nutrient efficiency. The aims of the project are primarily to generate practice-relevant findings on climate and nutrient efficiency in an animal genetic resource for the first time and to increase the supra-regional competitiveness of angler cattle, which contributes to securing the preservation of this valuable animal genetic resource.

Non-farmer stakeholders

Advisors:

1. Agrar-Beratung-Mitte
   Represented by Hauke Hansen.
   Hauke is a farm advisor specialised on dairy farms with focus on farm economy and efficiency. Hauke is member of several EIP-Operational-Groups in Schleswig-Holstein.
   Agrar-Beratung Mitte offers advise with respect to
   feeding control and ration calculations.
   fertilizer and cultivation planning, crop protection in forage production
   Business administration (final analysis, operational planning - target development calculations, liquidity analysis and
   Assistance with applications and compliance with Cross compliance requirements.
2. Landwirtschaftskammer Schleswig-Holstein
   Represented by Johannes Thaysen.
   Johannes is special consultant for forage conservation and grazing. Johannes is member of several EIP-Operational-Groups in Schleswig-Holstein
   Landwirtschaftskammer Schleswig-Holstein is a politically neutral levy-based authority, it monitors the entire agricultural area of Schleswig-Holstein, including agriculture, forestry, fisheries and horticulture. The Schleswig-Holstein Chamber of Agriculture represents the professional interests of employers and employees in agriculture, forestry and horticulture. The most important tasks of the Chamber of Agriculture are advice and basic, advanced and further training for employers and employees in agriculture and forestry.

3. Agrar-Beratung-Nord
   Represented by Uwe Bäumer, Uwe is a farm advisor specialised on dairy farms with focus on farm economy and efficiency as well as ruminant nutrition. Uwe is member of several EIP-Operational-Groups in Schleswig-Holstein
   Agrar-Beratung Nord offers:
   Independent management consultancy and specialist knowledge for milk production.
   Business administration and production technology in dairy cattle/fodder production
   Business administration and production technology in plant cultivation
   Advice on the use of automatic milking systems (AMS)
   Interface to all important partners and authorities in the agricultural sector.

Education:

1. Landwirtschaftskammer Schleswig-Holstein
   Represented by Tammo Peters.
   Tammo is special consultant and teacher for grass + forage production and grazing. Tammo is part of the team coordinating the vocational farmers training in Schleswig-Holstein. Tammo is member of several EIP-Operational-Groups in Schleswig-Holstein.
   Landwirtschaftskammer Schleswig-Holstein (also listed as advisory service) is a politically neutral levy-based authority, it monitors the entire agricultural area of Schleswig-Holstein, including agriculture, forestry, fisheries, and horticulture. The Schleswig-Holstein Chamber of Agriculture represents the professional interests of employers and employees in agriculture, forestry and horticulture. The most important tasks of the Chamber of Agriculture are advice and basic, advanced and further training for employers and employees in agriculture and forestry. LK-SH (chamber of agriculture) possesses excellent technical facilities with respect to field experiments and knowledge transfer. LK-SH runs the well-equipped training center Futterkamp, which is dedicated to animal production. Futterkamp keeps a modern dairy herd (High-Yield-Confinement-System but also runs demonstration experiments with grazing dairy cows), to be used both for experimental and training purposes.
2. University of Kiel
   Represented by Dr. Ralf Loges and Prof. Uta Dickhöfer
   Ralf is senior scientist and lector for Grass and Forage production at Kiel University and lector for organic farming at both University of Kiel and University of applied sciences Kiel-Rendsburg. Ralf is member of several EIP-Operational-Groups in Schleswig-Holstein.
   Ralf is coordinating information transfer at Kiel university's Knowledge transfer centre and research farm Lindhof (Lindhof acts also as pilote farm for low-input milk production) Uta Dickhöfer is full professor for animal nutrition and director of the Institute of Animal Nutrition at Kiel University and was former professor for animal nutrition at Hohenheim University. Uta is future responsible leader Kiel university's Knowledge transfer centre and research farm Lindhof.
   Kiel University (UKIEL) is a fully-fledged university with over 26,000 students and around 3,000 members of staff. UKIEL uses research, teaching and the transfer of science to address. the great challenges of our time in health, environmental and cultural change, nutrition and energy. Its Agricultural Faculty has specialised research institutes with relevance for dairy farming. Against the national trend of the past ten years, Kiel University has a growing number of agricultural students. Which is partly due to an increasing internationalization and the development of new study courses that address global agricultural problems, as demonstrated in the new specialized international master's degree in milk production.

Researchers:

1. University of Kiel
   Represented by Prof. Friedhelm Taube, Christof Kluß and Sabine Mues
   Friedhelm Taube is full professor for Grass and Forage science and director of the Institute of Crop Science and Plant Breeding at Kiel University. Friedhelm Taube is the responsible project leader of the German part project of R4D. Friedhelm Taube is member of several EIP-Operational-Groups in Schleswig-Holstein. Friedhelm has extensive experience in the evaluation of the eco-efficiency of milk production on dairy farms based on both own experimental measurements and on the use of tools for life-cycle-assessments. Parameters considered here are greenhouse gas emissions (CO_2, CH_4 and N_2O), nitrate-leaching to the ground water, soil-C-sequestration, energy-use efficiency and biodiversity. His experience is of high importance for WP3 (Evaluation and assessment of solutions for resilient Dairy Systems) of R4D. From the above-mentioned projects and other interdisciplinary projects carried out together with farmers, environmental organisations, policy makers, agricultural, advisors and farmers, UKIELGFO has large experience in assessment of innovative tools and methods with respect to environmental effects and economic performance relevant for WP 3 and 4.
   Christof Kluß is scientist in the Department of Grass and Forage Science (GFO), he is specialist in data management, statistical analysis and development of dynamic models for prediction of yield formation and changes of forage quality for grass and silage maize, that are intensively used by German farmers with respect to predict the optimal harvest time for grass and maize crops.
   Sabine Mues is scientist in the Department of Organic Farming, she is both Farm manager of the above-mentioned experimental research Farm Lindhof (low input dairy production), but also coordinating field experiments with focus on grass and forage production under conventional management at Kiel University's experimental farm Hohenschulen. She is specialist for farm economics and organic farming.
   More information about Kiel University (UKIEL): see above under education.

   Additional research linked to the German NDA
2. WUR Wageningen University & Research (Department of Animal Sciences/Animal Production Systems). Professor Dr. Friedhelm Taube is special professor in Grass based Dairy Systems Animal Production Systems Group (APS) at Wageningen University and Research (WUR), The Netherlands. As mentioned above Friedhelm has extensive experience in the evaluation of the eco-efficiency of milk production on dairy farms based on both own experimental measurements and on the use of tools for life-cycle-assessments. Parameters considered here are greenhouse gas emissions (CO_2, CH_4 and N_2O), nitrate-leaching to the ground water, soil-C-sequestration, energy-use efficiency and biodiversity.
3. Landwirtschaftskammer Schleswig-Holstein (Mentioned above also as advisory service and educational institution)
   Represented by Tammo Peters and Johannes Thaysen.
   Tammo is special consultant and teacher for grass + forage production and grazing. Tammo is carrying out applied research in grass and forage production. Johannes is special consultant for forage conservation and grazing and is carrying out applied research in forage conservation and grazing based milk production.
   LK-SH runs the well-equipped training center Futterkamp, which is dedicated to animal production. Futterkamp keeps a modern dairy herd (High-Yield-Confinement-System but also

runs demonstration experiments with grazing dairy cows), to be used both for experimental and training purposes.

Farmer based organisation:

1. Landwirtschaftskammer Schleswig-Holstein (Mentioned above also as advisory service and educational as well as research institution)
   Represented by Tammo Peters and Johannes Thaysen (above mentioned).
   Landwirtschaftskammer Schleswig-Holstein is a politically neutral levy-based authority, it monitors the entire agricultural area of Schleswig-Holstein, including agriculture, forestry, fisheries and horticulture. The Schleswig-Holstein Chamber of Agriculture represents the professional interests of employers and employees in agriculture, forestry and horticulture. The most important tasks of the Chamber of Agriculture are advice and basic, advanced and further training for employers and employees in agriculture and forestry.

Dairy industry:

1. DMK
   Represented by Dr. Philipp Inderhees, Global Head of Corporate Strategy at DMK. He is specialist for sustainability of the Dairy sector. Dr. Inderhees joint the NDA based on an invitation of Prof. Friedhelm Taube who is the responsible project leader of the German part project of R4D.
   With more than 20 sites, the DMK GROUP is Germany's largest dairy company. DMK is We're also active in the Netherlands and Italy and in selected international hubs. In total, DMK employ around 7,500 employees within the company, and around 5,200 active farmers supply milk as raw material.
   Right from the start DMK supported the R4D project and expressed their interest in the outcome of the project with a letter of intent.

Government:

1. Ministerium für, Landwirtschaft, Umwelt, Natur und Digitalisierung (Schleswig-Holstein Ministry of Agriculture, Environment, Nature and Digitalization)
   is one of seven ministries of the Schleswig-Holstein state government. The Ministry is responsible for the following topics, among others: Agriculture, protection of species (biodiversity), coastal protection, animal welfare, nature conservancy.
   Represented by Dr. Thorsten Reinsch. Thorsten's areas of expertise are greenhouse gas emissions, carbon footprint of agricultural products, nitrogen cycle of farming systems, forage production on peat-soils and manure application techniques.

Non Governmental organisation:

1. Deutscher Verband für Landschaftspflege e.V. German Association for Landscape Maintenance (DVL) is a non-profit umbrella organization of German landscape conservation organizations, such as landscape conservation associations, landscape conservation associations, biological stations and comparable associations in Germany. The German association for landscape conservation represents the interests of its members and is committed to landscape conservation within the framework of the Common Agricultural Policy (GAP) and the nature conservation support programs of the federal states. In cooperation with local landscape conservation associations, the DVL organizes model

projects on topics from agriculture and nature conservation.
Represented by Dr. Helge Neumann. Helge's areas of expertise are: grassland biodiversity, farmland birds and management of grasslands dedicated nature protection. Helge is member of several EIP-OGs.

Innovation-transfer organization:

1. Schleswig-Holstein Innovation office EIP-Agrar: coordinating 13 EIP-Operational-groups with focus on dairy. The Innovation Office supports the Ministry in the implementation of the new EIP agricultural policy instrument and coordinates project work. Simultaneously, the Innovation Office provides Operational Groups with information, assistance and support in the planning, implementation and execution of their project ideas. Networking between groups within Schleswig-Holstein and cooperation in north German with Lower Saxony and Mecklenburg-Western Pomerania is another important task, as well as cooperation with DVS and its European partners. Active public relations work ensures the exchange of information on project results, and it supports the desired transfer of knowledge into practice.
Represented by Carola Ketelhodt as head of Innovation. Carola is specialist for innovation transfer and Contact officer for 21 EIP-OGs.

Facilitation methods

What have we done?

So far, the German regional NDA of Schleswig-Holstein has been gathered 2 times in person. Both times on a pilot farm. (9th of December 2021 on the farm of Christian Cordes in Wanderup, Germany and on the 21st of June 2022 on the farm of Hanno Lammers in Winnert, Germany). On the first meeting the R4D project was presented. This was followed by a discussion of needs from the viewpoint of the agricultural dairy sector with respect to A. socio-economic resilience, B. technical resilience and C. environment, animal welfare and society. The first meeting was rounded of by a first collection of Innovations/solutions to help solving the needs. The first meeting was dominated by political challenges with respect to limited fertiliser use, and new labels for animal welfare on animal products, as well as on increased proses for concentrates.

On the second meeting all participants worked together to define resilience. Since the first meeting in December the world had changed dramatically because of the Ukraine-war. Dramatically increased costs and delivery problems for nearly all purchased inputs (concentrates, energy, machinery, building material…..) . All participants all participants agreed that the increased price for conventional raw milk so far covers the increased costs. All participants are afraid that the process for dairy products for private German customers have reached the point, that higher prices can't be realised, which consequently will decrease farm income when input-prices further will increase. So, it was high time to discuss possibilities to increase resilience on German dairy farms. The three pilot farmers who took part in the R4D-cross visits at Ireland/Northern Ireland, told about solutions seen on the visit or discussed with farmers from other European regions.

What was easy?

It was easy to motivate members to participate in the NDA. Exchange between different agricultural sectors leads to better understanding and to constructive discussion to solve needs.

What was difficult?

As in other countries the COVID-19 situation made it difficult to bring the group together. Due to other obligations or seasonal farm work, it is difficult to gather all the NDA members at the same time.