

The DairyCare RoadMap

DairyCare

DairyCare is the EU-funded COST Action FA1308 in dairy animal health and welfare. DairyCare supports a range of cross-disciplinary networking activities. The purpose of this document is to provide an overview of what DairyCare hopes to achieve during its four year lifetime. This the first part of the RoadMap, which provides the overall framework at the Action level. Working Group Activities will be described separately.

DairyCare Objective

To improve dairy animal husbandry by combining biological, technological, engineering and social science expertises to optimise interactions between farmers and dairy animals.

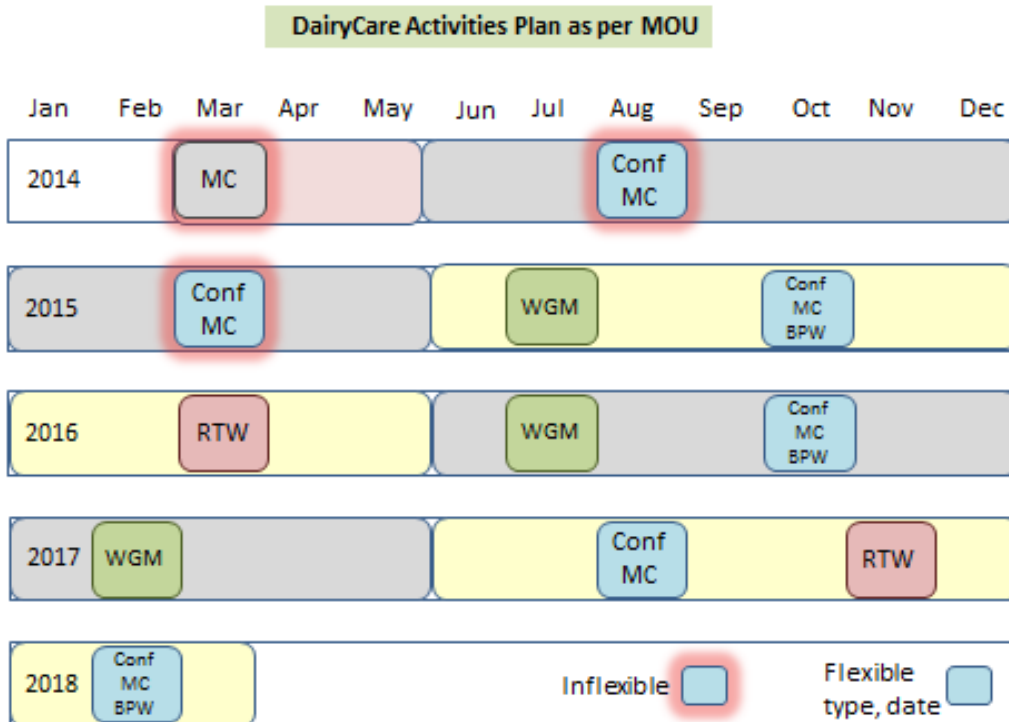
DairyCare Action Tools and Programme

DairyCare will use a number of tools to achieve its objective:

- Conferences will bring together interested participants for scientific debate around relevant topics
- Working Group Meetings (WGM) will bring together smaller groups for more focused debate about specific topics relevant to the individual WG or WGs
- Research Training Workshops (RTW) will provide training in relevant techniques for younger scientists
- Best Practice Workshops (BPW) will be held in conjunction with some Conferences to disseminate best practice to end-users
- STSMs will enable exchanges of younger researchers between partners to spread expertise, skills, technologies and knowledge

The Action is managed by the Management Committee (MC), which meets at least yearly in conjunction with a Conference. The draft timetable of activities is shown at Figure 1.

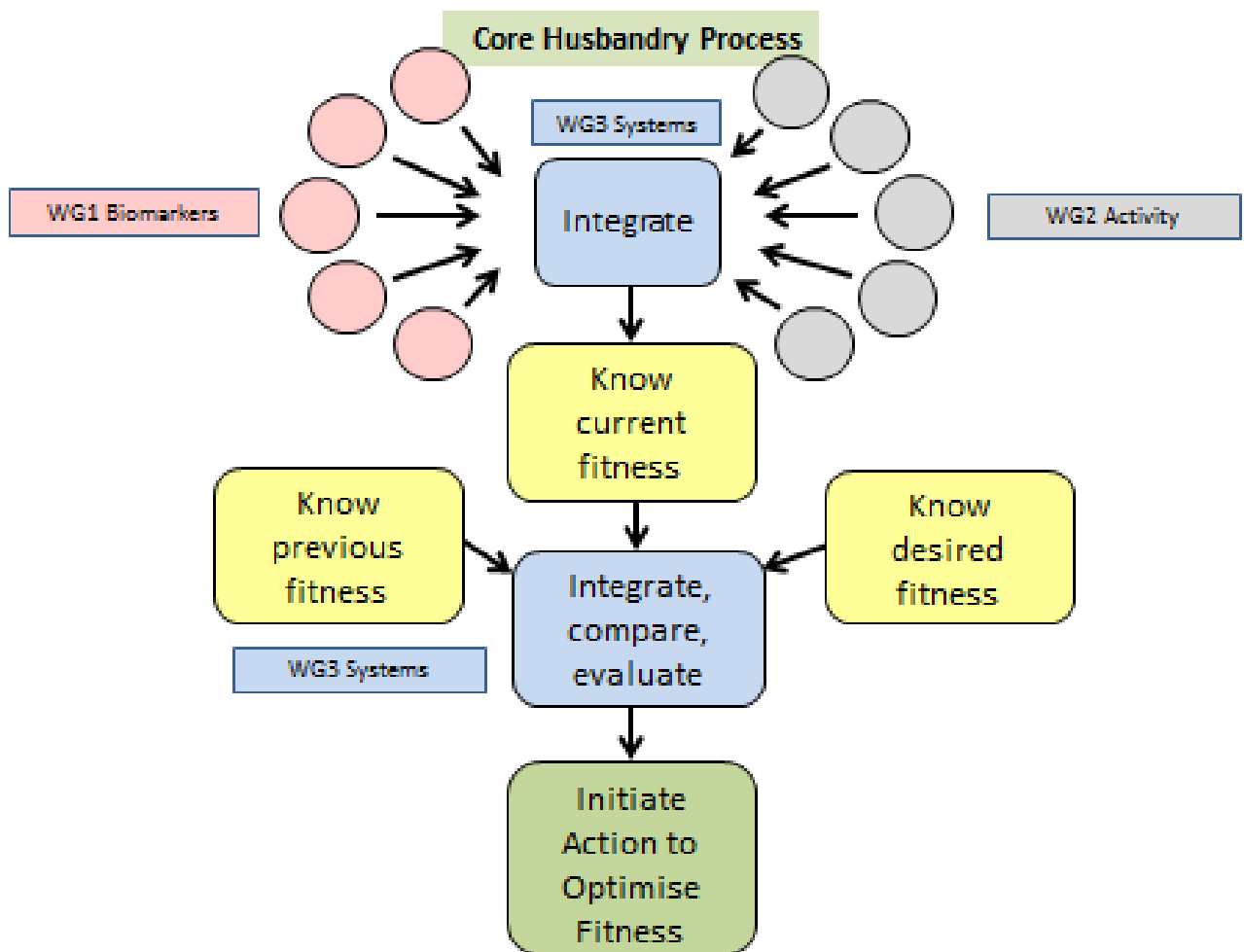
Figure 1. Draft Four Year Timetable of DairyCare Activities



DairyCare's Core Process: Technology to Assist Good Husbandry

Good husbandry entails using a set of cues to assess the current state of an animal's fitness, then comparing this with a desired state and finally, if necessary, taking an appropriate action. The decision will typically also take into account the animal's physiological state, the environment it is in and its recent history. These basic processes are potentially amenable to technological assistance, or even replication.

Figure 2. The Core DairyCare Husbandry Process



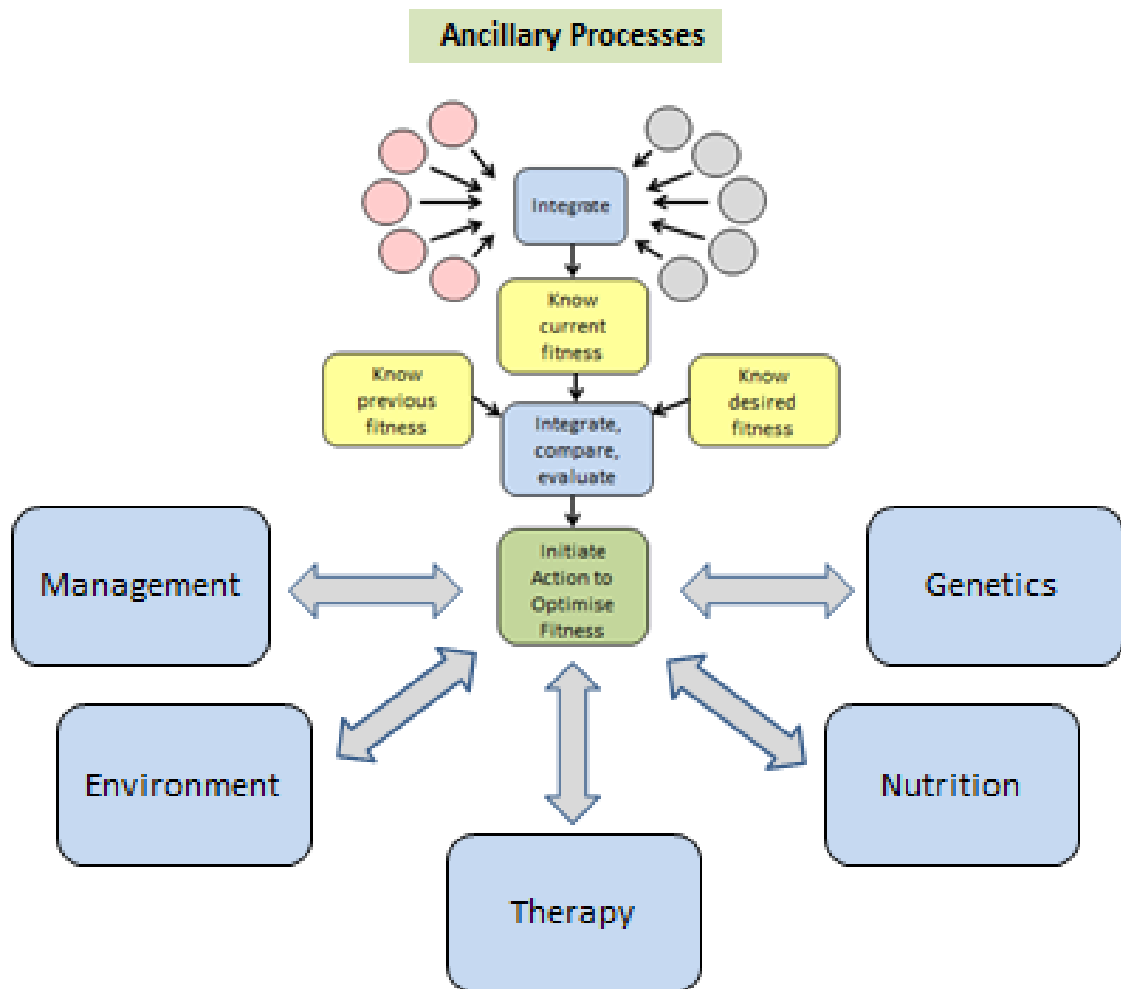
DairyCare recognizes two categories of cues that can be integrated to create a technology-based assessment of an animal's state (Figure 2):

- Biomarkers include physiological variables such as hormone, metabolite, substrate or product concentration in relevant biological samples, ideally obtained non-invasively. This is the remit of Working Group 1
- Activity measures include locomotion, feeding behavior, time budgets, social interactions and positional location. This is the remit of Working Group 2.
- Integration of these cues identifies the individual animal's current state of fitness, which is then compared to its history and a predefined "desired fitness". A suboptimal outcome means the animal is "flagged" for the herdsman to take action. This is the remit of WG3.

DairyCare’s Ancillary Processes: Factors Impacting On and Impacted By Fitness

The end stage in the Core Process is an alert to a herdsman or manager that a particular animal requires attention. The response will depend on many circumstances, but will essentially require a modification of the animal’s general management, environment or nutrition, and may require a therapeutic intervention from a veterinarian or consultant (Figure 3). The animal’s genetic background may also be taken into account. In this scenario these factors are animal-directed, but the knowledge that builds up from identifying animals at-risk will soon start to be useful as a management-directed tool, influencing longer term nutrition, environmental design and breeding programmes. These ancillary processes are within the scope of DairyCare’s remit, but subsidiary to the Core Process. A major challenge will be to establish the relationships with industry that will be essential to exploit these opportunities.

Figure 3. Ancillary Processes Relevant to DairyCare



DairyCare’s Contribution to Societal Challenges

“European agriculture... must deal with dwindling natural resources, the effects of climate change, the changing global demographic and the need to provide a sustainable, safe and secure food supply for its citizens”....“Research activities and policies will help to cope with the (three) main challenges these sectors are facing today: securing viable food production in face of a growing world food demand...”

Not our words, but from the EU Research and Innovation and Horizon 2020 websites, where one of the 7 identified Societal Challenges is “Food Security, Sustainable Agriculture and Forestry, Marine, Maritime and Inland Water Research and the Bioeconomy”. In a nutshell:

- The world will need more food
- Demand for animal-derived foods will increase
- Producing food in a sustainable way will be paramount

This has led to the emergence of the concept of “sustainable intensification” (SI), initially in relation to crop production and latterly including animal production as well. The general premise behind most interpretations of SI is to produce more from less (land), but issues such as the ability of ruminants to utilize marginal land and the importance of supporting smallholder production are also included within the concept. In other words, SI is much more of a concept than a specific reality. This provides an opportunity for DairyCare: through better understanding of the fitness of the individual animal, management can be improved to optimize healthy, welfare-friendly productivity, which will in turn enable sustainable intensification. The ability to quantify wellbeing will enable a totally transparent industry, providing consumers with products of defined welfare quality. The immediate challenge is to provide definitions and identify specific contributions that can be made (Figure 4).

Figure 4. DairyCare’s Contributions to Societal Challenges

