Brussels, 27 May 2022

COST 038/22

DECISION

Subject:	Memorandum of Understanding for the implementation of the COST Action “LIFT: Lifting farm animal lives – laying the foundations for positive animal welfare” (LIFT) CA21124

The COST Member Countries will find attached the Memorandum of Understanding for the COST Action LIFT: Lifting farm animal lives – laying the foundations for positive animal welfare approved by the Committee of Senior Officials through written procedure on 27 May 2022.

MEMORANDUM OF UNDERSTANDING

For the implementation of a COST Action designated as

COST Action CA21124
LIFT: LIFTING FARM ANIMAL LIVES – LAYING THE FOUNDATIONS FOR POSITIVE ANIMAL WELFARE (LIFT)

The COST Members through the present Memorandum of Understanding (MoU) wish to undertake joint activities of mutual interest and declare their common intention to participate in the COST Action, referred to above and described in the Technical Annex of this MoU.

The Action will be carried out in accordance with the set of COST Implementation Rules approved by the Committee of Senior Officials (CSO), or any document amending or replacing them.

The main aim and objective of the Action is to define and conceptualise positive animal welfare, to identify valid methodologies to assess positive animal welfare, to assess the understanding and acceptance of this concept, and to suggest potential animal- and resource-based indicators of positive welfare to be monitored on farm.. This will be achieved through the specific objectives detailed in the Technical Annex.

The present MoU enters into force on the date of the approval of the COST Action by the CSO.

OVERVIEW

Summary

The COST Action 'LIFT' will provide the background for including positive welfare in farm animal welfare assessment.

The traditional approach to animal welfare was to prevent suffering and there is consequently a large bias in the science of animal welfare towards the study of negative experiences. Recent advances, however, are leading to considerations of positive experiences, also referred to as positive welfare, which is more in line with consumer and citizen expectations. There is currently no agreement among researchers on what constitutes positive animal welfare, or what kinds of techniques, tests and procedures are sound methodologies to assess positive experiences in farm animals. Consequently, no welfare assessment scheme currently includes direct animal-based indicators of positive experiences.

The COST Action will progress this research area in a multidisciplinary scientific approach by cross-discipline knowledge sharing, training and Europe-wide collaboration to lay the foundations for this growing area of research. The main aims are to 1) define positive farm animal welfare and clarify its concepts, 2) identify valid approaches to assess positive animal welfare, and 3) select methods suitable for on-farm use and provide recommendations for the inclusion of aspects of positive welfare in farm animal welfare assessment schemes. Throughout, stakeholders responsible for welfare assurance schemes from industry, government and NGOs, as well as veterinary organisations and advisory bodies for farmers are involved to ensure practical feasibility and to improve the animal production sector's sustainability.

Areas of Expertise Relevant for the Action	**Keywords**
● Animal and dairy science: Ethics of animal and dairy science	● Positive welfare ● farm animals ● affective states ● methodologies ● welfare assessment

Specific Objectives
To achieve the main objective described in this MoU, the following specific objectives shall be accomplished:

Research Coordination
● To develop common definitions of the terms and concepts used in the area of positive farm animal welfare, and to identify knowledge gaps in fundamental and applied research.
● To provide valid research methods to assess positive animal welfare, including writing a Code of Good Research Practice.
● To provide recommendations for the inclusion of animal- and resource-based measures of positive welfare in farm animal welfare assessment schemes.
● To coordinate throughout the project research efforts on positive welfare, including short- and longer-term affective states in farm animals
● To disseminate throughout the Action the outcomes and knowledge to researchers and the wider society

in the form of at least three peer-reviewed publications and at least 10 lay dissemination materials, such as news items (e.g. website articles, newspaper articles), leaflets, webinars and videos

Capacity Building

● To provide equal opportunities for female and male Young Researchers and Innovators (YRI) from a diverse geographical background to take leading roles in the Actions' WGs, and to take on committee roles in the Actions' Management committee.
● Actively include COST Inclusiveness Target Countries as members, provide them leadership roles and stimulate progress in the research area through meetings in these countries and opportunities for mobility (STSMs). Further, to encourage these countries to take research initiatives in and promotion of animal welfare friendly production
● Foster knowledge exchange by twice-a-year meetings and annual workshops
● Provide continuous opportunity for STSMs and closely coordinate courses and Training Schools.

TECHNICAL ANNEX

1. S&T EXCELLENCE

1.1. SOUNDNESS OF THE CHALLENGE

1.1.1. DESCRIPTION OF THE STATE OF THE ART

Producing food for humans in a sustainable manner is a challenging yet necessary step for the future. Many of the farm animal production systems today threaten sustainability with their impact on the environment (e.g. greenhouse gas emissions), human health (e.g. dust) and non-human animal (hereafter animal) welfare. As long as animals are kept for food production, there will be ethical concerns related to their treatment. Article 13 of the Lisbon Treaty states that animals are sentient beings, and Member States shall pay full regard to the welfare requirements of animals kept by humans. Animal welfare is, thus, an important component of social sustainability that must be aligned with advances in environmental and economic sustainability if overall sustainability is to be achieved.

Concerns, definitions and measures to assess animal welfare have been evolving over the years, related to changes in societal beliefs and values and improved scientific understanding of animals. The traditional approach to animal welfare has a strong focus on reducing negative aspects of animal welfare, including hunger and thirst, discomfort and pain, injury and disease, fear and distress (Tannenbaum, 2002). This focus on negative aspects dates back to the Five Freedoms elaborated in 1979 by the Farm Animal Welfare Council (UK) based on the Brambell Report (Brambell, 1965). Four of the five freedoms indeed relate to the prevention of negative experiences in an animal's life. There has hence been a large bias in animal welfare research towards the study of negative experiences at the expense of positive ones (Shriver, 2014). This bias is also reflected in the animal welfare indicators used in current assurance schemes. For example, the Welfare Quality® project, one of the most widely applied EU projects on farm animal welfare assessment, focused primarily on the development of protocols for assessing negative indicators of animal welfare, with only a small section devoted to positive welfare and a note that further developments in this area are needed.

The focus on reducing negative aspects of animal welfare does not fully cover the current expectations of citizens and consumers in Western societies. The latter associate animal welfare with opportunities for the animals to express natural species-specific behaviour and to experience positive states, in addition to the minimisation of suffering (Lassen et al., 2006; Robbins et al., 2018; Miele, 2011; Vigors, 2019). Citizens and consumers in Western societies are calling for better welfare as exemplified by campaigns to "End the Cage Age" and breed slower-growing "Better Chicken", with the goal of achieving "a good life" for captive and domesticated animals (Green and Mellor, 2011; Yeates, 2011; Vigors et al., 2021). A good life does not only involve minimising negative experiences but necessitates the promotion of positive experiences as well. Therefore, future research in the field of animal welfare should identify positive animal-based measures and related resource-based measures leading to positive welfare.

Although in its infancy, research into positive aspects of animal welfare is developing rapidly (Marchant-Forde, 2015). For example, within the last 3 years there have been three journal special issues related to positive welfare (in Animals and in Frontiers in Animal Science). A systematic literature search on positive welfare by Lawrence et al. (2019) led to 38 articles, 10 of which were specific to positive animal welfare. Advances in our understanding of farm animals have led to considerations of positive

experiences when defining and assessing animal welfare (Boissy et al., 2007; Mellor, 2016). It is now apparent that although the study of negative experiences may have more moral urgency, simply aiming at an absence of negative experiences does not adequately describe animal welfare (Boissy et al., 2007; Green and Mellor, 2011) and does not fulfil consumer expectations (Vigors, 2019).

There is currently a lack of agreement about what constitutes positive welfare. Several terms are used for different aspects of positive welfare, including positive emotions, positive affective engagement, quality of life and happiness (Lawrence et al., 2019). Discussions about positive welfare incorporate overlapping concepts and ideas, upon which different research groups place different degrees of emphasis (Rault et al., 2020, Vigors and Lawrence, 2019). For example, the term “happiness” in the context of animal welfare science has been used to refer to a personality trait (Boissy et al., 2007), a short-term emotion or longer-term mood (Paul et al., 2005; Boissy et al., 2007; Mendl et al., 2010), or it has been equated with human quality of life (Yeates and Main, 2009). Rault et al. (2020) identified two distinct views on positive welfare in the literature, namely “hedonic positive welfare” and “positive welfare balance”, whereby the first relates to short-term and transient positive experiences, also referred to as positive emotions and moods, while the latter refers to the overall balance of positive and negative experiences and hence describes something more long-term, even across an entire life.

Central to animal welfare, and hence subjective experiences, are affective states. Affect is used here as an umbrella term for short-term emotions and longer-term moods. As with definitions of animal welfare, definitions of affect are diverse, whether in relation to animals or humans (Kremer et al., 2020). It is, however, commonly asserted that affect involves a subjective experience that varies in pleasantness (valence) and activation (arousal) (Mendl et al., 2010; Paul and Mendl, 2018), as conceptualised in two-dimensional space (Figure 1). In line with an increasing interest in animal affect, a growing body of methodologies has been proposed for assessing affect in animals (Kremer et al., 2020). These methodologies involve the measurement of behavioural, cognitive or physiological variables that are thought to vary with, or be an inherent part of, affective experiences.

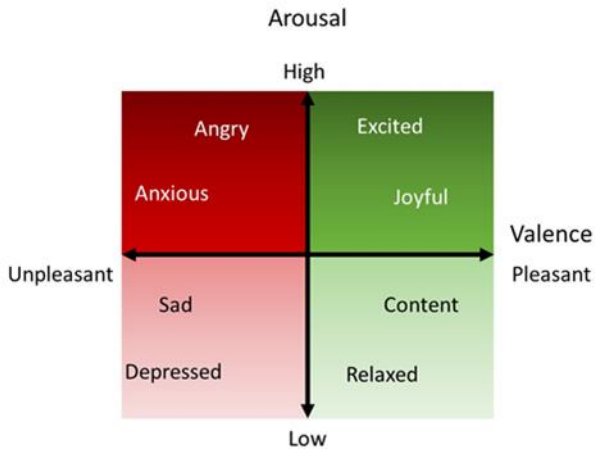

Figure 1. The circumplex model of affect (Russell, 1980), as applied in animal sciences, where emotions and moods are conceptualised in a 2-dimensional space along the axes of valence and arousal. From Kremer et al. (2020) based on Mendl et al. (2010).

Behaviour thought to reflect positive affective states falls into two main categories: changes in the whole body and changes in specific body parts. Changes to the whole body include, for example, play behaviour (Held and Ŝpinka, 2011), body postures (Nowak et al., 2011) and social, affiliative behaviours (Mellor, 2015), while changes in body parts include ear postures (Lambert and Carder, 2019), tail

postures (Camerlink & Ursinus, 2020) and changes in eye aperture (Battini et al., 2019). However, there are questions about the interpretation of these responses. For instance, while play behaviour is typically supressed by welfare threats, such as disbudding (Mintline et al., 2013), low milk allowances (Jensen et al., 2015), weaning from the dam (Donaldson et al., 2002) and poor physical growth (Brown et al., 2015), it is not clear that it increases when positive conditions become even more positive (Ahloy-Dallaire et al., 2018). In addition, behavioural changes occurring during a state of moderate arousal may be easier to interpret than those occurring in very high or low arousal states (Fureix and Meagher, 2015). Vocalisations can also express information about the affective state of the caller. For example, positive affective states are usually characterised by a short call duration and low fundamental frequency (Briefer, 2012), though this varies somewhat between species (Laurijs et al., 2021). In spite of possible limitations to the application to positive welfare assessment (e.g. need for a high number of vocalisations to be analysed and difficulties for human assessors to evaluate sounds), recent developments in automated sound recognition are opening new opportunities in this field (Halachmi et al., 2019).

Affect has also been assessed by studying cognitive biases in judgement (Harding et al., 2004), attention (Lee et al., 2017) and memory (Burman and Mendl, 2018). While attention and memory bias research is still in its infancy, evidence of positive judgement of ambiguity, i.e. optimism, has been assessed using various protocols in a wide variety of animal species. Nevertheless, this research raises a number of theoretical questions that have yet to be answered (Lagisz et al., 2020; Roelofs et al., 2016; Kremer et al., 2020 and 2021; Doyle et al., 2010).

Potential physiological markers of positive affect have been studied at the neuroendocrine (e.g. oxytocin: Rault et al., 2017), immune (e.g. immunoglobulin A: Hucklebridge et al., 2000) and autonomic levels (e.g. heart rate variability: Von Borell et al., 2007; nasal temperature, Proctor and Carder, 2015). Other markers, possibly of longer-term positive affect or even life-long positive welfare, have also been proposed, such as low fluctuating asymmetry (Knierim et al., 2007), low telomere attrition (Bateson, 2016) and low allostatic load index (in humans: Schenk et al., 2018). As with behavioural and cognitive markers, the time course of the response (e.g. acute, circadian rhythms, life history patterns) is crucial to interpretation of results. Moreover, invasive sampling should be avoided whenever possible, as repeated sampling can impact on the propensity to experience certain emotions, which in turn may impact long-term welfare. In general, a combination of several indicators is more likely to reveal the complexity of affective experiences than reliance on a single marker. It is also important to distinguish between biomarkers for traits (linked to e.g. personality) and states (linked to affect) (Kremer et al., 2020).

Finally, positive welfare will likely be linked to the opportunity for animals to realize their own goals (Yeates and Main, 2008), to have control over their environment (Franks and Higgins, 2012), and to achieve flow, positive engagement and a sense of agency (Špinka, 2019). Moreover, the study of positive welfare also increases the need to address animal consciousness (Paul et al., 2020). These topics have been mentioned in the past but require more elaborate discussions and research to become established within animal welfare science.

1.1.2. DESCRIPTION OF THE CHALLENGE (MAIN AIM)

There is a compelling need to bring researchers together to define and conceptualise positive animal welfare as well as a need to assess the understanding and acceptance of this concept among non-academic stakeholders. The overall aim of this project is to bring cohesion to EU scientific research into positive animal welfare while ensuring that knowledge, understanding and future agendas are aligned with non-academic stakeholders in the EU. The focus is on farm animals, that is animals raised for the

production of animal-source foods. The multiple challenges outlined above are structured into three sub-aims, addressed by three work packages (WP). Non-academic stakeholders have a strong voice in the project in two of these WPs and are integrated as critical friends (Kemper et al., 1997) in the sphere of influence (Figure 2) who will follow the project from start to end.

The three sub-aims are:

1. To define key concepts in the field of positive animal welfare to create shared definitions (WP1).

2. To scrutinise specific methodological domains in the assessment of positive animal welfare leading to the creation of a common research agenda across the EU, a research forum for ongoing and planned research, a Code of Good Research Practice and capacity building via knowledge sharing (WP2).

3. To devise potential animal-based and resource-based indicators of positive welfare suitable for on-farm animal welfare assessment protocols and labelling schemes, taking into account country- and region-specific aspects (WP3).

The project structure in terms of people is presented in Figure 2.

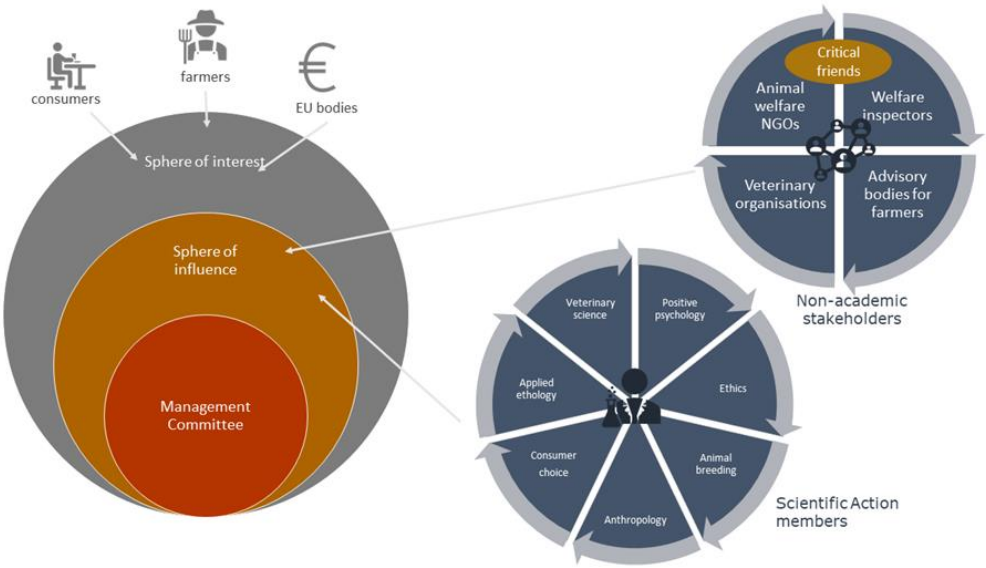

Figure 2. The parties involved fall into the project core, represented by the Chair, Vice Chair and Management Committee, the sphere of influence and the sphere of interest. The sphere of influence includes both the scientific community (secondary proposers and key scientists included during the Action) as well as non-academic stakeholders (who may also be secondary proposers, or be included during the action, including animal welfare NGOs, welfare inspectors and animal product labelling schemes). They will follow the Action throughout and be asked for feedback at the end of every year of the Action's lifetime. The sphere of interest includes stakeholders influenced by the Action, but not directly involved, e.g. consumers, farmers and EU bodies. For instance, the three EU Reference Centres for Animal Welfare (EURCAW for Pigs, Poultry SFA and Ruminants&Equines) will attend relevant meetings and contribute to discussions.

From the above-described state of the art, there are three domains where intense discussion, decision-making and implementation are warranted. These are presented below as three separate work packages.

Work Package 1. Defining key concepts in the field of positive animal welfare: Various definitions of positive welfare and related concepts have been proposed (Lawrence et al., 2017; Lawrence et al., 2019; Rault et al., 2020) with researchers having different conceptualisations of positive welfare. One point of discussion is whether a positive experience relates to an absolute positive experience or to a positive contrast effect (Shanab et al., 1969), which is based on a relative difference, i.e. better than before (Ahloy-Dallaire et al., 2018). Another point is whether the removal of punishing events results in a positive state of relief. Absolute positive experiences and relative positive experiences may both be "positive", but they may be qualitatively different and located in different quadrants of the core affective space depicted in Figure 1. Conceptually this links to the idea that activation, or deactivation, of reward acquisition and punishment-avoidance systems map onto the four quadrants of core affect space (e.g. Mendl & Paul, 2020). This discussion boils down to the question of whether positive states can be measured on absolute or relative scales. In the scientific literature, different approaches to positive welfare have been taken (Rault et al., 2020), namely positive welfare as 1) a positive experience, positive emotion or mood, i.e. a temporary and transient affective event (e.g. joy in a bout of play) and 2) as a cumulative balance of states across a lifetime where the positive experiences outweigh the negative ones, also referred to as a good life (Green and Mellor, 2011), quality of life (McMillan, 2005) or satisfaction with life/happiness (Webb et al., 2019). A possible method to present these outcomes is through the creation of conceptual maps where concepts are defined and relationships between the concepts explained (e.g. as in Lawrence et al., 2019). Although it may not be feasible, or essential, to reach consensus on a single definition of positive welfare, similar to the fact that there is no unified definition of animal welfare, there is a need for clarity and for researchers to clearly state their position regarding positive welfare (Rault et al., 2020). Acknowledging and discussing the topic is essential for the selection of appropriate measures for the assessment of positive welfare.

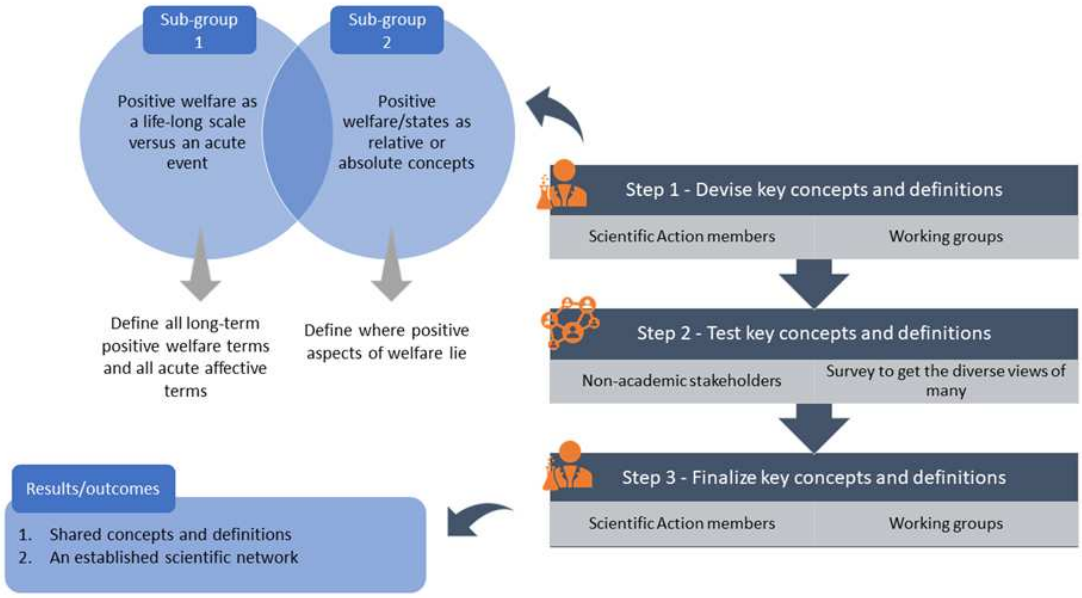

Figure 3. In Work Package 1 (defining key concepts), three steps are followed. Key concepts and definitions from the scientific community in step 1 are presented to non-academic stakeholders in step 2 to get their views. This offers a way of testing concepts and definitions and subsequently adapting them to reflect the understanding and concerns of the non-scientific community. Stakeholders include all those mentioned in Figure 2, and they will be approached via a survey to secure the diverse views of many people. The scientific community (always with input from the critical friends shown in Figure 2) form two sub-working groups for discussion of concepts and definitions

for both long-term and short-term concepts of positive welfare, and the distinction between true positive and relative positive experiences. The outcomes of WP1 are shared concepts which are presented in a website and a review paper as well as scientific connections across the EU that last beyond this project. WP1 ensures that the scientific community is aligned and communicating with the non-scientific community in the emerging field of positive animal welfare.

Work Package 2. Identifying valid methodologies to assess positive animal welfare: Animals may differ substantially in how frequently and strongly they express affective states in their overt behaviour (Špinka, 2012), depending on e.g. life history, social systems, communication strategies and the intensity of selective breeding (Rauw et al., 1998). Expressions of low arousal positive emotions such as contentedness may be subtle, and sensitive approaches may be required to detect significant differences. Some indicators of affect such as animal vocalisations reflect both affect valence and arousal (Briefer, 2012; Brudzynski, 2013). Behavioural, physiological and cognitive science are increasingly applied to address questions on positive emotional states. In addition, neuroscience may be a way forward. Comparisons of vertebrate brain structure have revealed similarities in neural circuits and parts of the brain that are important for affective experience and processing (Knight et al., 2013; Andics et al., 2014). Beside quantitative measures, qualitative assessments have increasingly been applied, for example proxy reports used by caretakers in zoos (Robinson et al., 2016). In farm animals, the Qualitative Behavioural Assessment (QBA) method, where observers rate the overall demeanour of the animal on a visual analogue scale, has been validated against physiological outcomes (e.g. Rutherford et al., 2012). As in social sciences, there are, however, questions as to the accuracy of qualitative ratings and proxy reports: In human quality of life (QoL) research, the link between proxy-reports and self-reports of various aspects of QoL is inconsistent (Cummins, 2002; Sheffler et al., 2009; Matsumoto et al., 2011; Maoz et al., 2014; Egilson et al., 2017). Another recently proposed method (Webb et al., 2019), drawn from human happiness research, is affect balance. This is based on multiple-moment observations: the ratio of pleasant to unpleasant affect or more simply the frequency of positive affect (Bradburn, 2015). Affect balance can be computed in non-verbal beings by sampling expressive behaviours, such as laughing (Panksepp, 2005) or crying; a method that has, for example, been used to measure affect balance in human infants (Schultz, 2014). Moreover, the rapid technological developments in precision livestock farming (PLF) offer opportunities for measuring behaviour and physiology with greater precision and over longer periods (e.g. Halachmi et al., 2019). The many questions linked to presently used methodologies (see also section 1.1.1) are tackled in WP2 in an international and interdisciplinary setting.

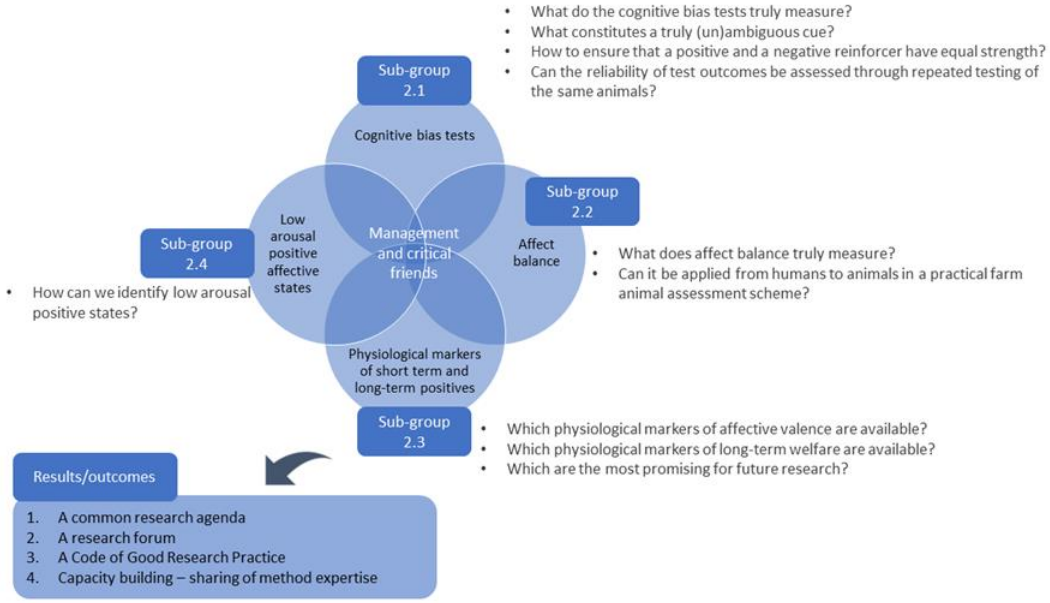

Figure 4. In Work Package 2, four to five sub-working groups are formed to tackle specific methodologies under the coordination of an overarching working group, the management committee and critical friends (see Figure 1). Initially, the questions that need to be addressed per methodology are outlined, but the sub-working groups themselves (formed of secondary proposers and other key scientists) formulate and complete the key questions per methodology. The topics presented here are examples of what could be included in each sub-group. The outcomes of WP2 are a common research agenda, a research forum (planned and ongoing research on a website of the project), a Code of Good Research Practice, and finally and importantly capacity building via significant sharing of expertise in the various methodological domains.

Work Package 3. Devising potential indicators of positive animal welfare to be used on-farm: Current welfare assessment schemes for farm animals mostly lack aspects of positive welfare, except for QBA in the Welfare Quality® protocols. Identifying, validating and including positive animal- and resource-based measures has the potential to increase the standard of animal welfare on the farm. Many positive animal-based welfare measures are expressed when threats to welfare are absent and their occurrence may signify the presence of positive affective states. However, even animals with no threats to welfare may be prevented from experiencing positive affective states, for instance due to limited resources (e.g. space for play behaviour; Jensen et al., 1998), which illustrates the relevance of interpretation based on both resource-based and animal-based information. Including measures of positive welfare is also necessary to satisfy consumer demand (Healy, 2017). Current marketing of products with higher animal welfare standards is focussed on positive aspects, e.g. “happy egg” (happyegg.com) and happy cow (news.arlafoods.co.uk/news/new-study-looks-to-create-happy-cow-measure-for-dairy-herds), as this is more appealing to consumers. In practice, however, it usually means “less suffering” as the assessment schemes do not include measures of positive welfare (but see Edgar et al., 2013). Industry and certification bodies are increasingly interested in including aspects of positive welfare in their schemes (Healy, 2017), but practical application is largely lacking. Collaboration between researchers, industry and NGOs on both a regional and European level is needed to integrate positive animal welfare aspects into practice to ensure the creditability of welfare assessment schemes.

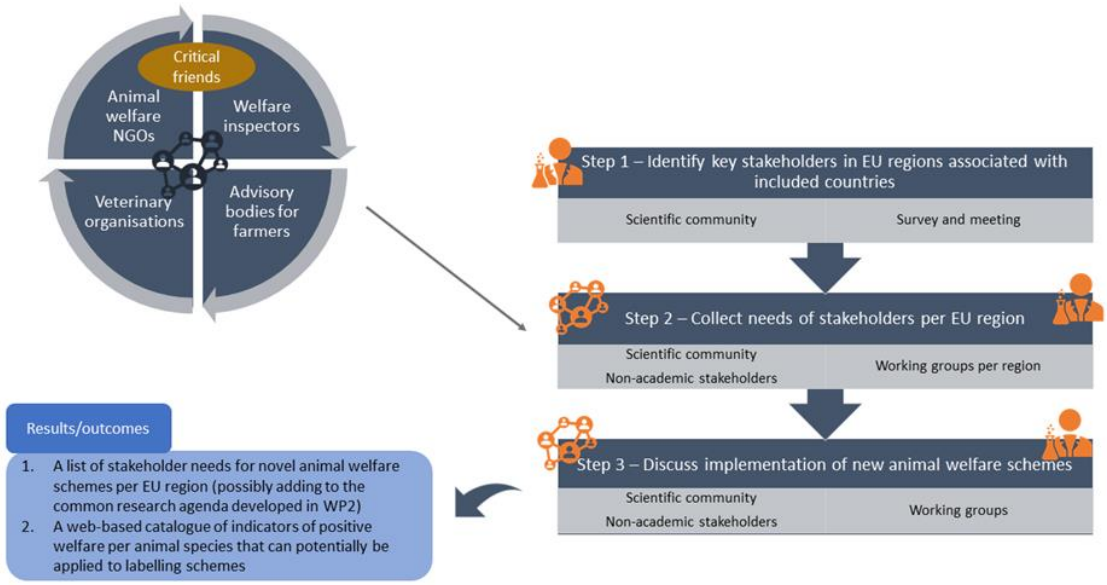

Figure 5. In Work Package 3, particular animal-based and resource-based indicators of positive welfare which can be monitored on farm are identified including positive acute experiences and long-term positive welfare. Here, as in WP1, we follow a step-wise approach starting with the identification of relevant stakeholders, in this case by country or region. In each country, at least one stakeholder from one of the stakeholder groups (Critical friends: Animal welfare NGOs, Welfare inspectors, Veterinary organisations, Advisory bodies for farmers) is identified by Action participants. In this way, we not only cross disciplines and cross private-public boundaries but also cross regional boundaries and take local and cultural influences and factors into account. The regional sub-working groups are supervised and coordinated by an international working group (WG3) formed by the Management committee with representation from all regions.

Relevance & Timeliness

There is a need for international discussion on the terminology and definitions of positive welfare, on approaches and methods as well as on the application of findings to animal welfare assessment, including animal welfare schemes and labels. Various research groups in Europe have initiated research into positive welfare. Although some collaboration exists, these initiatives are predominantly independent and of relatively small size. There is little exchange of research ideas, methodologies and skills between countries, and the lack of a network for collaboration and coordination has already led to overlapping efforts within Europe in animal experiments on positive aspects of animal welfare. Collaborative efforts at this early stage will therefore contribute significantly to the development and potency of strategies to address the 3Rs (Reduction, Refinement, Replacement) for animal experimentation. Overall, it may substantially advance a generation of scientific knowledge and accelerate improvement of farm animal welfare in Europe and beyond.

Furthermore, strong collaborations with non-academic stakeholders will ensure common understanding and implementation of research results. To enhance active communication, dialogue and knowledge exchange, WP3 shall create a learning space for stakeholders, including local actors at the country and region level. Together with a cohesive and collaborative research community, this will ensure efficient acquisition of new knowledge and application of this knowledge towards lifting the lives of our farm

animals in Europe, which is our mission and which fits with the global vision of a sustainable food system for people.

1.2. PROGRESS BEYOND THE STATE OF THE ART

1.2.1. APPROACH TO THE CHALLENGE AND PROGRESS BEYOND THE STATE OF THE ART

The current state of the art hardly goes beyond the theoretical level, with few existing methodologies for assessing positive affective states, and many questions remain (reviewed by Mattiello et al., 2019). Consequently, welfare assessment and labelling schemes focus on minimising negatives rather than promoting positives, leaving us a long way away from the societal expectation that farm animals have "a good life".

This COST Action addresses these challenges by ensuring cohesion throughout the EU not only among researchers but also relevant stakeholders, whose involvement ensures applicable outcomes from this Action. The specific activities and outcomes of this Action as well as the specific groups involved are outlined in Figures 3, 4 and 5 above.

The first sub-aim (WP1) is to develop a common understanding of the terms currently used in the area of positive farm animal welfare, for instance through the use of concept maps to bring clarity and cohesion to the terms, to integrate the terms and to identify current gaps in research. To this end, researchers from different disciplines will form two focussed sub-working groups on the diverse topics and terminology (see Figure 3). Researchers from human psychology will be invited to join these groups (identified via secondary proposers who are psychologists themselves), as the field of positive human psychology has previously gone through a similar debate on terminology and definitions (Lomas, 2016). Once key concepts have been defined in the first step, these will be evaluated by stakeholders via a survey, and subsequently tuned and adapted by the working groups.

The second sub-aim (WP2) is to propose a common research agenda and a Code of Good Research Practice at an international level on valid research methods to assess positive animal welfare. Researchers from different disciplines (see Figure 4) will meet in four to five separate sub-working groups to present and discuss specific questions within methodological domains. A forum for ongoing and planned research projects will be created in the LIFT COST Action's website where researchers can share the methodologies they are currently working on, including experiences from pilot trials and results of completed projects. Training schools (TS) and Short Term Scientific Missions (STSMs) to learn about the most promising methods will be organised to increase understanding, promote best practice and create capacity building by sharing expertise.

The third sub-aim (WP3) is to make a web-based catalogue of potential positive welfare indicators to be used in farm animal welfare assessment and labelling schemes. This is created as a database with suggested measures accompanied by a guide to their recommended use. Involvement of the organisations who carry out welfare assessments and wish to include the measurements in assurance schemes is essential for success, and these key stakeholders are therefore included in the consortium as critical friends (Figure 2). This WP will take local and country-specific needs and factors into account, hence Action participants are asked to identify and invite non-academic stakeholders to be involved in specific region-based sub-working groups (Figure 5). These groups will subsequently propose indicators of positive welfare (animal- and resource-based) for specific types of farm animals which could be used in both welfare assessment schemes and labelling schemes lead by industry, government, or NGOs.

Management of Workplan

In addition to the Management Committee (MC) and the WGs, an Executive Committee (EC) will be appointed consisting of the MC Chair and Vice Chair, the WG leaders, a STSM/TS coordinator, a dissemination coordinator and a communication officer, and will meet twice yearly. The Executive Committee will assess and approve outcomes prior to delivery, coordinate dissemination, coordinate meetings and workshops, establish a website, ensuring that capacity building is optimized, and evaluate the achievement of objectives. The communication officer will manage and update the website as well as other social media associated with dissemination.

Several approaches are taken in line with the COST Networking Tools:

1. Thematic interdisciplinary scientific meetings with targeted working groups to address the main aims.

    a. Twice a year, an overall Action meeting will be organised with at least one meeting per year in an Inclusiveness Target Country. One of these meetings will be organised alongside one of the international conferences held in Europe (e.g. International Society for Applied Ethology (ISAE), The European Association of Animal Production (EAAP), the International Conference on Assessment of Animal Welfare at Farm and group Level (WAFL)), conferences to increase participation and to host workshops (see point 3c below). This also reduces travel needs, thereby contributing to environmental sustainability, aligning with university policies on ecological footprint, and the desire of many researchers to reduce their carbon footprint.

    b. Specific working group meetings will take place by video conferencing, but organisation of meetings in-person will be supported if this enhances the progress of the WP beyond what is possible through the other means of communication.

2. Stakeholder participation includes animal welfare NGOs, Welfare inspectors, veterinary organisations and advisory bodies for farmers.

    a. Representatives from each stakeholder group are approached in a web-based survey in the first year of the project to provide input to the scientific working groups of WP1.

    b. A stakeholder group, with representatives from each stakeholder category, will be formed in the second year of the project and will meet with Action Management and representatives from the sub-working groups of WP2 to provide input to the questions addressed in each working group.

    c. In WP3, stakeholders from each participating country are invited and take part in regional sub-working groups to make sure that regional concerns are addressed. Input from regional sub-working groups are subsequently presented and discussed at a joint Action meeting.

3. Workshops/Training Schools

    a. A yearly in-depth course for PhD students and early career researchers (i.e. training schools) focussing on interdisciplinary participation will be held, preferably, in Inclusiveness Target Countries to ensure active participation from those countries.

b. Financial support of PhD students from Inclusiveness Target Countries to participate in the biennial existing PhD course on animal emotion in 2023 and 2025.

c. A yearly satellite workshop at an International Conference in Europe, either of ISAE, EAAP, ASAB or WAFL.

4. Short Term Scientific Missions for PhD students and early career researchers to share expertise.

5. A website with dissemination targeted to all educational backgrounds of society (consumers, farmers, students, researchers). The website will be predominantly in English, but with links to information materials translated into other European languages.

Applying an interdisciplinary approach

The Action's main aims will be addressed at twice-yearly meetings between researchers in multiple disciplines. The focus of this Action is farm animal species for food production, but connections will be made with researchers working on other animal species in animal-related enterprises (e.g. zoos, laboratory animal facilities, companion and sport animal businesses) to share knowledge and ideas. Comparing the approaches taken with different species, including humans, will help develop concepts and measurement methods and stimulate implementation strategies applicable throughout the field of applied animal welfare. At the start of the Action, a workshop intended for all Action participants will take place on how to collaborate in interdisciplinary teams. The workshop will include guest lectures by researchers in Interdisciplinary Studies. This will provide the Action participants with the knowledge needed to collaborate in an interdisciplinary scientifically driven approach to positive welfare. The further workshops and training schools will build bridges between several disciplines. Much can be learned from human psychology, e.g. the developments in positive psychology, especially in the use of non-verbal methods to assess human happiness (reviewed by Webb et al., 2019). Also, the relationship between physiological correlates of accumulated stress and affective happiness should be thoroughly examined. Social scientists have profound knowledge of methods to conduct qualitative reports used to assess well-being and quality of life, and although these methods cannot be directly transferred to animals, connections between quantitative and qualitative research will be explored.

1.2.2. OBJECTIVES

1.2.2.1 Research Coordination Objectives

1. To provide common definitions of the terms and concepts used in the area of positive farm animal welfare, and to identify knowledge gaps in fundamental and applied research..

2. To create a Code of Good Research Practice on valid research methods to assess positive animal welfare.

3. To provide recommendations for the inclusion of animal- and resource-based measures of positive welfare in farm animal welfare assessment schemes.

4. To coordinate throughout the Action research efforts on positive welfare, including short- and longer-term affective states in farm animals.

5. To disseminate throughout the Action the outcomes and knowledge to researchers and the wider society in the form of at least three peer-reviewed publications and at least 10 lay dissemination

materials, such as news items (e.g. website articles, newspaper articles), leaflets, webinars and videos.

1.2.2.2 Capacity-building Objectives

1. To provide equal opportunities for female and male Young Researchers and Innovators (YRI) from a diverse geographical background to take leading roles in the Action's WGs, and to take on committee roles in the Action's Management Committee.

2. To actively include COST Inclusiveness Target Countries as members, provide them with leadership roles and stimulate progress in the research area through meetings in these countries and opportunities for mobility (STSMs). Further, to encourage these countries to take research initiatives in and promotion of animal welfare-friendly production.

3. To foster knowledge exchange by twice-a-year meetings and annual workshops.

4. To provide continuous opportunity for STSMs and closely coordinate courses and training schools.

2. NETWORKING EXCELLENCE

2.1. ADDED VALUE OF NETWORKING IN S&T EXCELLENCE

2.1.1. ADDED VALUE IN RELATION TO EXISTING EFFORTS AT EUROPEAN AND/OR INTERNATIONAL LEVEL

In the past, COST has funded a number of Actions on animal welfare, starting with Measuring and Monitoring Farm Animal Welfare (COST Action 846) and fish welfare (COST Action 867) followed by GroupHouseNet (COST Action CA15134) on damaging behaviours in pigs and poultry, the Action on keel bone damage in laying hens (CA15224), and the COST IPEMA concerning the breeding of entire pig males (CA15215). As all of these previous initiatives focussed on the alleviation/minimisation of farm animal suffering, it is time to move to the field of positive welfare, i.e. the promotion of positive experiences.

Several individual initiatives focus on positive aspects of animal welfare. For example, the NGO-led project "Happy Cows Milk" uses scoring schemes to assess indicators of positive welfare in dairy cattle in Portugal. Another example is the public-private sector grant funded by the Dutch dairy industry, based at Wageningen University, the Netherlands, which is currently looking into physiological indicators of positive (and negative) mood in dairy cows. In addition, the H2020 EU project "GrazyDaisy" includes investigation of indicators of cow and calf welfare related to bonding and positive social interactions, and the H2020 EU project "ClearFarm" includes the use of sensor technology to assess the balance of a limited number of positive and negative welfare indicators in animals in the pork and milk production chains and is a first effort to assess a generic indicator of quality of life/happiness/welfare in animals on farm. The proposers of this Action have established connections with these projects, and project leaders will be invited to join the Action. In addition, the project leader of the successful Animal welfare 2.0 proposal will be invited, as the outcomes of this Action will support monitoring the state of animal welfare in regions/countries and in relation to a group of operators, which is an expected outcome of Animal

Welfare 2.0. Collaboration will benefit from intellectual input and sharing of data and resources. It will also provide additional opportunities for STSMs for YRI.

The three EU Reference Centres for Animal Welfare (EURCAW for Pigs, Poultry SFA and Ruminants & Equines) have expressed their interest in this COST Action by sending a letter of support stating that they are keen to attend relevant meetings and contribute to discussions. They are especially interested in the outcomes of WP3 and are committed to contribute by providing knowledge on animal welfare indicators and welfare improvement measures.

Clearly, progress will be faster if existing efforts on developing positive animal welfare are coordinated. This Action will promote international coordination through the specific objective of WP2 with a common web-based forum for sharing information about research activities and the development of a Code of Practice on approaches to address positive welfare in farm animals. Due to the wide variation in animal welfare standards in Europe, the benefit of this Action is that participants from at least 23 EU countries will be able to ensure feasibility of the recommendations from a Europe-wide perspective.

2.2. ADDED VALUE OF NETWORKING IN IMPACT

2.2.1. SECURING THE CRITICAL MASS AND EXPERTISE

This COST Action proposal has a consortium of 23 COST member countries, including 12 of the 20 COST Inclusiveness Target countries. This shows that there is a Europe-wide interest in this research topic. With 23 COST member countries in the consortium and, in some countries, consortium members from different universities or organisations, we have the critical mass required to achieve our set objectives. Moreover, several more EU countries have shown interest in this endeavour, and they will be invited as COST participants. The Action is, therefore, expected to grow rapidly. Consortium members include researchers from many disciplines as well as NGO stakeholders, which supports the fact that there is demand. The involved researchers have worked on the topic of positive animal welfare and related concepts, securing a large expertise in this project. Only stakeholders with the necessary capacity to implement aspects of positive welfare in their assurance schemes have been invited to the Action. In practice, more stakeholders indicated their interest, and they will be included through surveys (Figure 3). Most consortium members are working predominantly with farm animals in line with the Action's objectives. However, researchers working on positive welfare in laboratory, zoo or companion animal species have expressed interest and may join as COST participants. The key persons from Europe, with publication records on topics related to this COST Action, are either included in the consortium or have expressed their interest to participate. Researchers and stakeholders from previous COST Actions on animal welfare will be invited as well to enable an efficient continuation of COST networks and initiatives. Other key persons from outside Europe have been invited to represent observer countries.

The consortium is balanced for gender and geographical location. Most are senior researchers, and attention will be given to invite YRI researchers, especially from COST Inclusiveness Target Countries to become members of the Action and to support them to advance in their career.

2.2.2. INVOLVEMENT OF STAKEHOLDERS

Action Members have a background in the field of animal sciences (animal behaviour, animal welfare), veterinary science, neuroscience, psychology, social science, anthropology, ethics, consumer choices, and sustainability.

The main stakeholders will be animal welfare NGOs, animal welfare assurance scheme bodies (including auditing bodies and retail companies with their own welfare labels/schemes) and advisory bodies for farmers. Several of the key stakeholders in this field, from across various European countries, have been contacted about this initiative and have confirmed their willingness to participate. Further contacts have also been listed, and the contact persons will be invited at the onset of the Action.

Citizens, consumers, farmers (farmers' organisations), competent authorities and EU bodies are not directly involved on the Action, but, to get their opinion, their representatives and spokespersons will be invited to meetings in WPs 2 and 3. Groups from this sphere of interest (Figure 2) will be invited to stakeholder meetings and surveys, and communication with them will enable us to propose novel ways in which assurance schemes could include positive indicators of welfare that balance consumer expectations, farmer concerns and wider societal concerns.

Outreach will be made to groups in the sphere of interest (farmers, veterinarians, EU Reference Centres for Animal Welfare, EFSA, as well as NGOs, industry and retailers without assurance schemes). For example, the Action's outcomes will be translated into several EU languages to reach the wider community in each participating country, and articles will be written for farmers' magazines/websites and newspapers.

2.2.3. MUTUAL BENEFITS OF THE INVOLVEMENT OF SECONDARY PROPOSERS FROM NEAR NEIGHBOUR OR INTERNATIONAL PARTNER COUNTRIES OR INTERNATIONAL ORGANISATIONS

Various key publications on positive animal welfare originate from researchers outside Europe. Dr Becca Franks of New York University, USA, who has expertise in positive welfare, has accepted to participate from the USA as an observer country representative. Dr Ngaio Beausoleil from Massey University, New Zealand, works with Professor David Mellor on positive animal welfare and has agreed to participate from New Zealand as an observer country representative. Drs. Franks and Beausoleil, as well as additional international experts, will be invited as speakers at Workshops and the Action will encourage YRIs to undertake STSMs internationally, as exchange between Europe and other regions of the world is needed for the concept of positive welfare to be embraced internationally.

3. IMPACT

3.1. IMPACT TO SCIENCE, SOCIETY AND COMPETITIVENESS, AND POTENTIAL FOR INNOVATION/BREAKTHROUGHS

3.1.1. SCIENTIFIC, TECHNOLOGICAL, AND/OR SOCIOECONOMIC IMPACTS (INCLUDING POTENTIAL INNOVATIONS AND/OR BREAKTHROUGHS)

In the short term, this COST Action will increase the collaboration between researchers working on positive animal welfare as well as increase the network and collaboration between researchers and stakeholders. The scientific impact is firstly that Action participants will benefit from increased knowledge through the conferences and workshops, training schools and STSMs. This knowledge will stimulate new and innovative research, especially in the COST Inclusiveness Target Countries in which many activities will be organised. STSMs will foster opportunities for YRIs to pursue a research focus on

positive welfare. The Action will thus result in increased research output across Europe and beyond. The Action's outputs, in the form of scientific and lay publications, on-line dissemination and training materials arising from the training schools, will contribute directly to the field of animal sciences.

In the long term, the increased collaborations and sharing of knowledge may foster new project applications and increase the research budget for positive animal welfare by highlighting its relevance and implications for improving animal welfare. To this aim, the writing of joint project proposals will be encouraged throughout the Action, for example through regular updates to the participants on joint funding opportunities. The close involvement of local stakeholders in the Action may in the long-term result in animal welfare friendly production systems becoming more widespread. The Action will thus sustain the EU's leading role in animal welfare friendly production and exports of these products. In cases where increased animal welfare comes with an economic cost, it is important that this cost is reflected in quantifiable indicators, which support "responsible consumption" (UN Sustainability Goal 12) through increased willingness to pay and reduced product consumption. Increased animal welfare may also result in increased productivity thereby having a positive socioeconomic impact on the livelihood of farmers (Dawkins, 2017).

On a European level, welfare assessment protocols for positive welfare can be compared across different farming systems, with access to various farming systems available through the partners in the consortium. On a more global scale, the Action addresses the sustainability of livestock systems, more specifically the social pillar of sustainability, and thereby contributes to Europe's sustainable development goals. In Europe there is a strong societal concern for the sustainability of our food, and in particular animal welfare, and a high expectation for continued improvements in animal welfare (Marchant-Forde, 2015; Healy, 2017). Bringing positive welfare scientists together will help lay strong, long-term foundations to a relatively new field of research, to bring consensus and to critically optimise research output, thereby accelerating the potential implementation into practice.

3.2. MEASURES TO MAXIMISE IMPACT

3.2.1. KNOWLEDGE CREATION, TRANSFER OF KNOWLEDGE AND CAREER DEVELOPMENT

Twice a year, an Action Management Committee meeting combined with Working Group (WG) meetings will be organised, of which at least one a year will be held in a COST Inclusiveness Target Country. Once a year, a Training School will be organised on a topic related to the themes of the WGs (Table 1). In addition, smaller workshops will be organised as satellites to related workshops and international conferences (Table 1). STSMs will be available for PhD students and YRIs. Several projects have been proposed in line with current activities, but more topics for STSMs will arise during the course of the Action and may be supported as well. The Action encourages YRIs to take leadership roles and make STSMs to other countries to expand their knowledge, skills, and scientific network. STSMs to COST Inclusiveness Target Countries will be especially encouraged.

Table 1. Overview of envisaged training events

Main training events & conferences	Year
Training schools organised within the COST Action	
1. Theory and concepts of positive animal welfare (to take place in Inclusiveness Target Country)	2022
2. Methodologies for assessing positive affect (incl. excursion to lab with cognition and neuroscience set-ups)	2023
3. Welfare assessment schemes (to take place in Inclusiveness Target Country)	2024
4. On-farm positive welfare assessment in practice	2025
Non-COST training events in which participation will be supported	
PhD course on Animal Emotions at Wageningen University, Netherlands	2023; 2025
Postgraduate course on practical animal welfare assessment; Estonia	2024
Potential conferences at which symposia, workshops and meetings will be arranged	
International Congress of the International Society for Applied Ethology (ISAE), Macedonia	2022
UFAW Yearly International Animal Welfare Science Symposium	2023
Annual meeting of Association for the Study of Animal Behaviour (ASAB)	2023
Annual meeting of the European Association of Animal Science (EAAP)	2024
International Congress of the International Society for Applied Ethology (ISAE)	2025
Proposed Short-term scientific missions	
Belly rubbing in pigs: bringing pigs into a positive state?	
Positive emotions as a result of cow-calf contact.	
Testing indicators of positive welfare on a zero-grazing dairy farm and comparison with indicators used in year-round grazing system	
Technologies to assess positive welfare in dairy cows and pigs.	
Expression of positive affects in human-animal relationships.	
Evaluation of affiliative social behaviours and social preferences.	
Positive low arousal states in cattle and pigs.	
On-farm assessment of play behaviour in poultry.	
Creating personality profiles using positive behaviours.	
Activity in broilers: A measure of positive welfare?	

3.2.2. PLAN FOR DISSEMINATION AND/OR EXPLOITATION AND DIALOGUE WITH THE GENERAL PUBLIC OR POLICY

The dissemination coordinator of the Executive Committee (EC) will be experienced in dissemination (proven publication list and dissemination to lay audiences). Dissemination will be directed to three target groups: Action members and participants, the scientific community and the stakeholders (as described in 2.2.2), including outreach to indirect stakeholder groups (in the sphere of interest) who are not part of the Action. The dissemination strategy is categorised into a) scientific output; b) societal engagement; c) Action website and d) social media.

A) Dissemination of scientific output: Scientific publications produced by the Working Groups will be published as Open Access articles (e.g. Animal, Frontiers in Veterinary Science, Scientific Reports, Neurosci Biobehav Reviews, Biological Reviews) with funding provided by the Action to make them widely accessible. The publication of each new output will be communicated to the wider scientific community by posting it on the Action's website, as well as other relevant websites (e.g. the Animal Welfare Research Network (AWRN) website) and social media (see point d). Output will also be

disseminated at international conferences and workshops, including posters of the Action's outcomes at international conferences and oral presentations of the outcomes at the Action's workshops.

B) Societal engagement: The nature of the topic, being inherently positive in nature, usually elicits great engagement by the public, which is also attuned to hearing new findings with regards to how we interact and treat animals in positive ways. From the scientific information, lay articles will be written for suitable media, such as farmers' magazines, websites, newsletters and newspapers. Action Members will actively engage with the society at large through interviews for newspapers, radio and TV. Action participants are encouraged to present the concepts and results of the Action during public events, such as the European Researchers' Night (evenings organised to bring research closer to the public, organised across Europe), to reach a wider public and to motivate young people to embark on research careers.

C) Action website: The COST Action will have an interactive website where members can upload new items (e.g. short blogs on their publications), details on ongoing research (elaborated guidelines of methodologies; description of research activities) and an overview of national animal welfare assurance schemes. The website will be updated at least every two months to maintain an interactive and well-visited website. Action Members will be encouraged to make a 1-2-min video of themselves where they introduce their group and their work on positive welfare. Every two months, a new "introducing-your-team video" is uploaded. In this way, a wider community of researchers becomes known, rather than just 1-2 persons per country. Also every two months, a new poll with a question relevant to the Action will be launched on the website for the general public to respond to. The poll will also be shared across social media with a link to the website in order to increase exposure.

D) Social media: The Action will disseminate information through social media (Twitter, Facebook) to reach a wider audience. Twitter feeds can be analysed to gain insight in the public interest in the topic. At least one person will be assigned as Communication Officer to regularly update social media, including Twitter, Facebook and an existing active YouTube channel on animal welfare. The Action will have its own Twitter and Facebook accounts. Short informative videos will be produced from the workshops and training schools (after agreement of participants regarding privacy), and these will be made available on the website and the YouTube channel.

4. IMPLEMENTATION

4.1. COHERENCE AND EFFECTIVENESS OF THE WORKPLAN

4.1.1. DESCRIPTION OF WORKING GROUPS, TASKS AND ACTIVITIES

WGs of WPs 1 to 3 will together submit at least three manuscripts for publication in scientific journals (Open Access, e.g. Frontiers in Animal Science, Frontiers in Veterinary Science, PlosONE, Scientific Reports, Neurosci Biobehav Reviews, Biological Reviews) and will create per WP at least three dissemination items, or activities, to inform or involve the general public (e.g. video, webinar, newspaper article, or web article).

WG 1 "Defining key concepts of positive animal welfare" will be composed of researchers in animal sciences and researchers from human psychology, philosophy, and anthropology. The WG will split into two sub-working groups to focus on different aspects of positive welfare. The work is focussed on laying the foundations and finding common ground between all the disciplines in the research field. The activities include a survey to non-academic stakeholders and focussed discussion groups, and the main

outputs are shared concepts, which are presented on a website and a critical review paper on the use of terminology, concepts and definitions related to positive welfare.

WG 2 “Identifying valid methodologies to assess positive animal welfare” consists of researchers from various disciplines, including animal sciences, neurosciences and social sciences. They will report on the applied successful and unsuccessful test paradigms that have been carried out in the past and will assess these for their suitability to test the concepts as defined by WG 1. They will write a critical review of the various methodologies used to assess positive welfare. Depending on the number of methodologies targeted and the volume of research reviewed, the proposed review may be split into two or more (e.g. cognitive bias tests, affect balance, physiological markers, low arousal positive states). By the overarching working group, the questions to be addressed per methodology are outlined. Then the sub-working groups formulate and complete the key questions per methodology. The outcomes of WP2 are a common research agenda, a research forum (planned and ongoing research on a website of the project), a Code of Good Research Practice, and finally capacity building via significant sharing of expertise in the various methodological domains.

WG 3 “Devising potential indicators of positive animal welfare to be used on-farm” includes scientific Action members and stakeholders (critical friends) from industry and NGOs, and is carried out in three steps. Animal- and resource-based indicators of positive welfare, which are suggested based on the activities of WG 1 and WG 2, are presented and discussed with relevant regional stakeholders. Stakeholder views and needs are collected and the task of WG 3 is to discuss the feasibility of methods and protocols in practice and to suggest ways in which potential indicators may be implemented into labelling schemes taking into account country- and region-specific aspects. The working group is formed by the Management committee with representation from all regions and this international WG supervises and coordinates the regional sub-working groups. In each country stakeholders from Animal welfare NGOs, Welfare inspectors, Veterinary organisations, and Advisory bodies for farmers are identified by Action participants in order to cross disciplines, private-public boundaries as well as regional boundaries.

TASK “Dissemination and Knowledge Transfer and Exchange” is listed under 3.2.2. This task is the responsibility of the dissemination coordinator, the communication officer and the Executive Committee.

TASK “Coordination of mobility and training” including the coordination of the Training Schools and STSMs is the responsibility of the STSM/TS coordinator and the Executive Committee. The Training Schools will be organised by a local organising committee but will be overseen by the Executive Committee in order to provide as many members as possible with the opportunity to participate. Here, reports and articles from completed STSMs will be collected and uploaded on the Action’s webpage. The STSM/TS coordinator will together with the leader of WG2 create and maintain an overview of ongoing research projects on the Action’s Website (Research Forum) where researchers will share information about their projects and can look up information.

4.1.2. DESCRIPTION OF DELIVERABLES AND TIMEFRAME

The deliverables and timeframe are listed in section 4.1.4

4.1.3. RISK ANALYSIS AND CONTINGENCY PLANS

Reaching the objective of WG3, i.e. to propose ways to integrate positive welfare into animal welfare assurance schemes, partly depends on the involvement of stakeholders. To mitigate the risk of poor stakeholder involvement, relevant stakeholders (NGOs and industry/retail with assurance schemes)

have been informed about the consortium and are invited to become involved in Action activities from the very beginning.

RISK	Risk level	Contingency plan
Scarce involvement of stakeholders	low	Stakeholders have been approached but may withdraw. As a contingency, we may approach other stakeholders, and engage stakeholders with existing collaborations with Action members.
Cancellation of in-person meetings due to restrictions related to international epidemics, e.g. due to COVID-19	medium to high	The COVID-19 pandemic has impacted active COST Actions. Contingency plans will be implemented based on EU and national travel restrictions and COST recommendations. As a contingency plan, physical meetings will be substituted by virtual meetings or hybrid meetings that allow the full option of break-out areas, shared breaks and discussion groups, to maintain the networking component in meetings.

4.1.4. GANTT DIAGRAM

Year	1				2				3				4			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Milestones																
Create network, invite members																
Action meetings (cf. “Networking Tools”)																
Facilitate formation of WGs 1, 2, 3																
Form sub-groups of WG 1 and 2																
Concepts and definitions devised																
Stakeholders surveys completed																
Shared concepts and definitions																
Contact contributors Research Forum																
Form critical friend/stakeholder group																
Common research agenda																
Stakeholder survey and meeting																
Regional WGs formed																
Identify, plan and execute STSMs																
Identify, plan and execute TSs																
Scientific Workshops																
Stakeholder Workshops																
Workshop @ international conference																
Deliverables																
Concepts and definition on website																
Scientific position & review papers																
Research Forum website																
Code of Good Practice on website																
List of stakeholder/regional needs																
Catalogue positive welfare indicators																
Training and course materials																
STSM reports																
Popular/general dissemination																
Networking Tools																
Action and WGs meetings																
STSMs																
Training Schools (TS)																
Workshops																