

Agricultural Productivity

Working Group

Report to the Food and Drink Sector Council

Executive Summary

February 2020

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Productivity is a measure of how efficiently resources (including natural resources) are converted to outputs rather than production. The rate of productivity growth in UK agriculture lags behind that of many of our major competitors. This undermines our industry's ability to compete in a more globalised market, deliver against consumer expectations and add value to the economy. Higher productivity growth would also positively affect the industry's sustainability since it can be closely correlated to lower environmental impacts.

Low productivity growth in UK farming and growing appears to be the result of a combination of factors which can be overcome through:

- 1) Harnessing the power of data and inspiring farming businesses to measure performance
- 2) Bringing co-ordination to our innovation system and ensuring investment in innovation targets key productivity and sustainability constraints
- 3) Defragmenting the landscape of knowledge exchange and providing more opportunities for farmers and growers to learn from the best
- 4) Facilitating investment in capital, skills, training and continuous professional development

The Agricultural Productivity Working Group (APWG) was established by mandate of the Food and Drink Sector Council and the chairmanship of Peter Kendall to identify how, working in partnership, industry and government could unlock greater productivity growth. The APWG's vision is for a world-leading, competitive and sustainable agriculture and horticulture industry that can meet consumer demands for high quality products at every price point. The group has avoided setting arbitrary targets but recognises a massive acceleration in agricultural productivity growth is needed urgently to achieve this vision.

The report starts with a vision for the future, setting out how the industry might look over the coming decades. It moves on to explain what we mean by productivity, what we understand of the problem and where the opportunity lies to address it. The report moves on to identify a package of five high level recommendations that the APWG sees as fundamental to achieving a step change in productivity growth. Each contains a series of actions, some of which build on previous initiatives such as the Agri-Tech Strategy and require momentum from both industry and government to succeed.

Recommendation 1 focuses on the fundamental need for **UK agriculture to become more data driven**, allowing performance measurement and the sharing of data to compare between farms. The recommendation highlights the need for **simple, entry-point KPIs** to be established and for policy incentives to promote data capture, use and sharing in a standardised way. It also acknowledges the need for culture change across the industry through a cohesive industry campaign to communicate the benefits for farm businesses of data collection and use for management. The recommendation also addresses the necessary structural change, emphasising:

- 1) The need for a **code of practice on agricultural data** to establish trust around data sharing and use
- 2) The need to ensure **common standards of interoperability** between data holding/management systems to enable effective data sharing
- 3) The need to **establish a trusted method of collecting and sharing data** in the UK agricultural sector

Recommendation 2 advocates the need to develop the **Evidence for Farming Initiative (EFI)** to address the fragmentation that surrounds our knowledge exchange landscape. This is characterised by a wide range of delivery bodies, limited co-ordination of effort, variable messaging and no central point where quality assured advice can be obtained.

EFI is based on principles underpinning the What Works network, which currently identifies and shares best practice across a range of public organisations in the UK. EFI will be industry-facing, focussing on the collation of evidence-based best practice recommendations, commercial testing of advice to provide quality assurance, and wide-scale dissemination of information for use by decision-makers.

It will provide:

- A single physical and digital hub for evidence-based best practice
- Scientific rigour, independence and objectivity
- Farm and practitioner-led identification of research needs and generation of evidence.
- Dynamic analysis, review of the available evidence and identification of gaps.
- A comprehensive and co-ordinated means of disseminating knowledge through multiple channels
- Recommendations to practitioners, decision makers, funding bodies, consultants, advisers, colleges and assurance schemes.

Whilst the initiative should be led and owned by industry stakeholders, it could play a powerful role in identifying innovation priorities and support evidence-based policy-making by government. Secure sharing of farm data via EFI will enhance impact, allowing monitoring of progress, both individually and as a wider industry.

The recommendation also identifies the opportunity to better co-ordinate existing activities to demonstrate best practice via **demonstration farms** as well as the potential to grow the network to provide more opportunities for farmers to learn from other farmers. This is seen as an important and proven means of facilitating engagement and uptake.

Recommendation 3 addresses the need to **align innovation funding and strategy** to the needs of the industry. Innovation drives the frontier of technical efficiency forward and is seen as the most important long-term driver of productivity growth in the sector. However, the uptake of innovation at scale appears to be poor. This report identifies key actions to improve the UK's innovation pipeline:

1. The need for greater industry leadership in determining innovation priorities. Industry representatives recognise that a more co-ordinated, evidence-led approach to identifying strategic research priorities is needed, informed by the Evidence for Farming Initiative.
2. A focus on strategic, transformative research 'missions'. This approach would see all actors in the knowledge and innovation system focusing their effort collaboratively in addressing a discrete series of strategic challenges for UK agriculture and horticulture, for example, how to achieve a net zero position in terms of emissions.
3. A multi and inter-disciplinary approach to innovation enabling all the fields of science that are relevant to productive, sustainable agriculture to work together. This approach would be further bolstered by multidisciplinary and inter-disciplinary calls.
4. Clearer pathways for innovation funding, including funding for farmer-led innovation
5. An ability to overcome regulatory hurdles that inhibit the development of potentially useful opportunities such as insect biomass
6. Improved connectivity between R&D funding and more targeted and sustained funding for translational research
7. Up-weighting of uptake and impact on the domestic industry in research funding criteria

Recommendation 4 deals with the low uptake of **agricultural skills and training**. In 2013, only 18% of farm managers in England had full agricultural training, with 61% relying solely on practical experience. As well as cultural barriers to uptake, agricultural training is provided by a wide range of organisations, across a wide range of topics. There is no single register of training organisations, or a central record of qualifications awarded. This fragmentation contributes to the low training uptake. The APWG has identified the following required actions drawn from the industry's Skills Leadership Group:

- 1) Create a central **Professional Body for Farming and Horticulture** which will serve as the home of professional development and training in England. The facility will implement a new skills strategy for industry; provide a framework for professional development; endorse curriculum development, signpost training courses and training providers and manage a central register for skills qualifications awarded
- 2) Create incentives through policy mechanisms that motivate farmers towards CPD and training uptake
- 3) Embed a culture of continuous improvement in the industry
- 4) Build a stronger profile of a dynamic industry to new entrants and recognise agriculture as a STEM industry

Recommendation 5 emphasises the need for **infrastructure and policy** to enable productivity gains both in terms of the wider economy and on farm. The achievement of several of the recommendations and case studies in this report is dependent on the provision of this infrastructure.

High capacity data flow is fundamental to artificial intelligence, an essential component of future high productivity farming & growing. 4G is currently adequate for the control and management of current equipment but will not meet future needs and is not securely available across rural areas. Farming and growing will require 5G coverage across all parts of the UK in order to harness the potential of precision technology, robotics and autonomous systems.

If the net zero carbon ambition is to be achieved by our industry, electrification of heavy farm machinery must be facilitated. Nationwide reinforcement of rural electricity infrastructure, including buffer battery storage systems, will be essential to deliver the required electrical flow for 'smart charging' of multiple high capacity batteries at times of peak activity in the farming calendar.

Facilitating investment in on farm infrastructure and capital are also seen as vital to long-term productivity growth and meeting the challenge of net zero. Land mobility is also seen as low in many parts of the UK, and access to long-term land lets is restricted, which can hinder the expansion of farms and see land remain under the control of those towards the end of their career. Facilitating the management of land by those who will adopt new tools, technologies and practices could have a subsequent positive impact on productivity.

The following actions are required:

1. Invest in **5G infrastructure** to enable required future data flow
2. **Upgrade the rural electricity network** to enable electrification of farm equipment
3. Facilitate the **active management of land** by productive, proficient farmers using different business models such as contract farming
4. Encourage **business focused investment** in primary agriculture

The report concludes by providing a summary of the key actions that will be needed from both industry and government to turn these high level recommendations into delivery plans.

The key priorities for industry are:

- Agreeing simple-entry point KPIs and getting them embedded into the culture of the farming and growing industry
- Establishing the blueprint for Evidence for Farming and ensuring buy-in to it from key industry players
- Collaborating more to showcase best practice, innovation and data
- Leading a campaign to promote skills, professionalism and life-long learning in the farming and growing sectors

The key priorities for government are:

- Providing the right policy incentives for data capture, sharing and skills uptake
- Getting behind Evidence for Farming as a critical part of the new infrastructure to improve the knowledge and innovation system
- Maintaining the directional shift in innovation funding and commissioning so that industry feels greater buy-in, there's more collaboration and focus behind a shared series of key 'missions'
- Facilitating the critical infrastructure in rural areas and on farms that will be needed to underpin greater productivity and sustainability as well as enable new technologies to be utilised at scale