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Department of Industry, Innovation and Science

Business
R&D Tax Incentive

Agrifood and the R&D Tax Incentive

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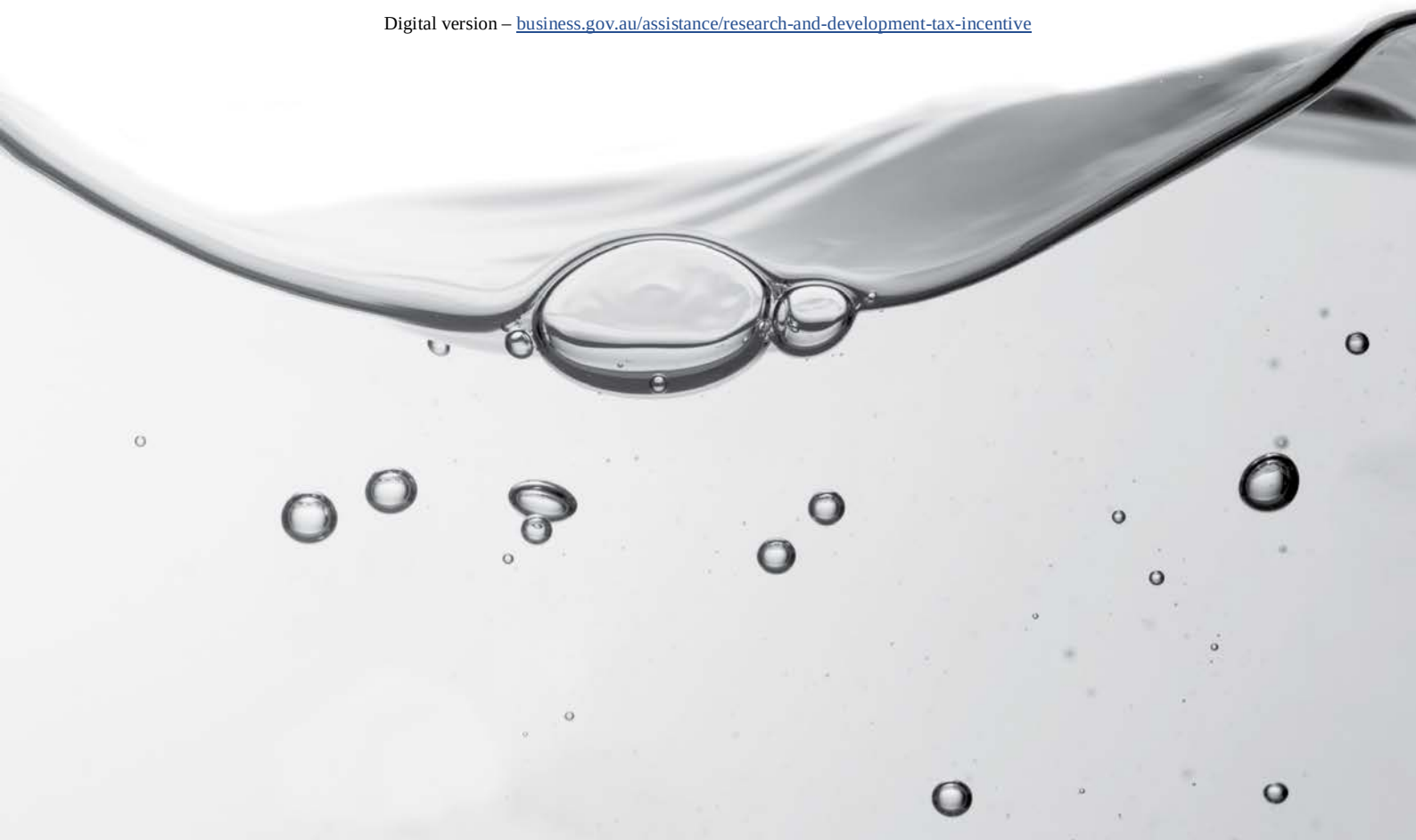

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Contents

How to use this Guide

The R&D Tax Incentive programme provides an incentive for companies performing eligible research and development (R&D). The programme is legislated and the rules appear in the legislation[1].

What does this guide do?

The Australian agriculture and food (agrifood) industry is underpinned by a highly integrated value chain. The industry sector is complex and has a high proportion of small and medium enterprises (SME) where, in many cases, R&D activities take place in an agricultural or production environment.

This guide helps clarify how to self-assess the eligibility of agrifood related R&D activities.

A series of examples show how to identify what eligible R&D might be and how to register eligible R&D activities.

No single example (or set examples) can represent the multiple combinations of company structures, operations, management, record keeping systems and expenditure. However, the business scenarios chosen attempt to broadly examine some highlighted issues identified as facing the agrifood industry and at various points in a business R&D cycle. These issues were identified during consultation with business, industry representatives and tax agents.

While they follow the same format, the focus of each example is different. Through this mix, the Department of Industry, Innovation and Science (the department) has aimed to illuminate the range of issues that arose during close consultation with the agrifood sector.

In addition, the department provides information on the R&D Tax Incentive that highlights issues relevant to the agrifood sector through business.gov.au and the *R&D Tax Incentive Information eBulletin*. This edition of the guide replaces the [2013] edition.

If your company is spending money to experimentally solve technical problems or experimentally develop new products or services, you may be undertaking some activities that qualify as R&D under the Incentive. The examples in the Guide [2] address key eligibility requirements such as:

- new knowledge,
- experimental process,

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[1] See, division 355 of the *Income Tax Assessment Act 1997*. The definitions of eligible R&D activities are contained in sections 355-20, 25 and 30 of that Act.

[2] The examples used in this guidance are fictional examples created to illustrate application of the R&D Tax Incentive to hypothetical commercial enterprises. The examples reflect the department's experience with jointly administering the programme with the Australian Taxation Office. No similarity of the examples to existing enterprises or projects is intended.

- core and supporting R&D activities,
- records management and compliance assurance,
- excluded activities, and
- activities likely to be ineligible.[3]

These concepts are incorporated throughout the guide with clear examples to highlight the issues. Commentary is also provided at the end of each example to direct companies to the important linkages to other guidance that has already been published to assist companies to de-risk their participation in the programme and evaluate their own 'compliance readiness'.

This guidance should be used in conjunction with the *R&D Tax Incentive*: *A Guide to Interpretation* which is available on the business.gov.au website.

Why is it important to use this guide?

This guide will assist companies and tax advisors to understand the eligibility requirements that apply to activities that are supported under the R&D Tax Incentive. Following this guide will:

- enable companies to self-assess and register eligible R&D, and
- help companies avoid:
  - compliance reviews, which may involve additional legal fees and tax agent fees, and
  - potential repayment of the tax benefit.

What is eligible R&D?

Eligible R&D is defined in the legislation. Companies self-assess whether their activities are eligible R&D activities before registering under the programme.

R&D Activities

Under the R&D Tax Incentive, R&D activities must either be:

- **Core R&D activities.** These are systematic, hypothesis-driven experimental activities with an unknown outcome and based on the principles of established science, undertaken to generate new knowledge (including new knowledge in the form of new or improved materials, products, devices, processes or services), or
- **Supporting R&D activities.** These are activities that are not part of the experimental activities, but directly support them.

Registration

The programme is accessed by registering self-assessed R&D activities with the department (this must be done within 10 months of the end of the company's income

[3] See page 9 for summaries of the examples that show these concepts.

year) and claiming for eligible expenses relating to the registered activities in the company's tax return.[4]

Companies applying to register for the R&D Tax Incentive must self-assess their activities against the legislated eligibility criteria. When a registration is accepted this does not mean that the registered activities have been determined to be eligible. The department routinely examines registrations in detail for compliance and may contact companies for further information.

The department applies the programme's legislative requirements during its registration and compliance processes and will do so as set out in its guidance. Registering companies must maintain adequate records that can allow self-assessment by substantiating the eligibility of R&D activities. Companies must ensure expenditure claimed for R&D activities is based on genuine financial records, as is the case for any element of their tax return.

Companies may choose to use an R&D tax advisor to help prepare applications and registrations. However, the use of an R&D tax advisor is not a requirement of entry into any departmental programme and using the services of an R&D tax advisor to assist with the preparation of a registration application and offset claim does not guarantee eligibility. Companies wishing to get an assurance whether particular activities they are currently conducting, or are intending to conduct, are eligible R&D activities may apply to the department for an Advance Finding.

Eligibility must be self-assessed for activities, not for whole projects.

Companies and advisors also need to be aware of expenditure that is ineligible under the R&D Tax Incentive. This includes:

- interest expenditure (within the meaning of interest in the withholding tax rules),
- expenditure that is not at risk,
- core technology expenditure, and
- expenditure included in the cost of a depreciating asset (decline in value notional deductions may apply however).

Note: Readers with questions about the eligibility of expenditure items on R&D activities registered under the R&D Tax Incentive should consult the ATO through its website at ato.gov.au/business/research-and-development-tax-incentive/, by phone on 13 28 66 (for businesses) or 13 72 86 (for tax agents).

Other relevant publications

R&D Tax Incentive: A Guide to Interpretation – this document provides companies with the government's interpretation of the legislative requirements of the programme, including a detailed overview of core and supporting R&D activities. In addition, there are checklists and examples of activities unlikely to meet the programme requirements.

[4] Information on the benefits available through the programme and the registration application form are available on business.gov.au.

Getting farming R&D Tax Incentive claims right – this document provides companies and tax advisors with guidance on areas they need to consider when self-assessing activities for eligibility under the R&D Tax Incentive. This document also discusses activities that do not meet the eligibility rules and highlights specific problem areas the department sees in incorrect claims.

Compliance Readiness

The department has released guidance to help companies that intend to register for the R&D Tax Incentive to ensure that they are 'compliance ready'[5]. Compliance readiness means having in place the systems and processes to identify, evaluate and record eligible R&D activities and expenditure on those activities. First-time participants in the programme should seek assistance from the department to make sure they understand the programme's requirements.

The following set of principles is suggested to assist companies in developing appropriate systems and processes to document their R&D activities and associated expenditure. It is important to note that the first step to ensuring compliance is reviewing and understanding the R&D Tax Incentive guidelines and requirements.

These principles have been informed by the department's experience in conducting compliance assurance activities. The principles also take into account key Administrative Appeals Tribunal decisions, where failures in a company's or tax agent's assessment of eligible R&D activities resulted in tax claims for R&D being overturned.

Maintaining contemporaneous documentation that demonstrates eligibility under the programme is essential. Companies cannot establish eligibility without maintaining detailed documentation that records the process of each activity as it develops.

Principle 1

Ensure that internal processes and systems allow for documentation of how activities meet eligibility requirements as part of the overall project planning and management process.

Principle 2

Identify and document eligible R&D activities at the time they are conducted – this improves the potential to capture associated costs in real time.

Principle 3

Document methods for identifying eligible R&D activities and recording expenditure associated with eligible activities. This ensures that there is a clear understanding of how information has been derived and enables the process to be repeated in future years.

Principle 4

Forge strong connections between those responsible for preparing and maintaining R&D Tax Incentive records and staff who understand the technical aspects of activities to enable a shared understanding of programme requirements.

Principle 5

Ensure that strong links have been established between activity and expenditure records

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[5] *Compliance Readiness – Importance of Record Keeping* and *Compliance Readiness – Risk Review and Findings* are available on business.gov.au.

The Examples

Projects to develop new products or services undertaken by companies are generally comprised of activities. Eligibility under the R&D Tax Incentive cannot be self-assessed at the project level. The legislation governing the programme requires eligibility to be assessed at the level of the activities within the project.

The examples in this document illustrate the eligibility requirements of the programme in the context of activities being conducted in hypothetical business scenarios.

Table 1 provides the reader with an idea of the level of detail contained in the examples on particular concepts.

Example 1a - Green to Grow part I (page 12)

Scenario

Development of a new irrigation and crop canopy strategy for agricultural production over several sites.

R&D Tax Incentive Principles

The example details the definition of eligible **core R&D activities** in a practical business situation. It also provides information on the importance of **record keeping** and commentary on **supporting R&D activities** and **feedstock** rules.

Example 1b - Green to Grow part II (page 17)

Scenario

Improving storage time of green leafy produce through the adoption of ethylene scavenging technology and modified atmosphere packaging.

R&D Tax Incentive Principles

This example shows a company applying for an **Advance/Overseas Finding** to allow it to register overseas activities. It also provides examples of **core** and **supporting R&D activities** and the applicability of the **dominant purpose test** and **feedstock rules**.

Example 2 – OzzieBugs (page 22)

Scenario

Development of characteristics and commercial farming conditions for improved seafood species.

R&D Tax Incentive Principles

This example shows how the R&D Tax Incentive can be used to support research that progresses through stages from laboratory to commercial farming. It highlights the eligibility of supporting R&D activities, the benefits of working with a Research Service Provider and the applicability of the **dominant purpose test** and **feedstock rules**.

Example 3 – BakingStuff (page 28)

Scenario

Product enhancement through use of specialised additives in breads.

R&D Tax Incentive Principles

This example examines some of the issues for companies conducting R&D activities to experimentally **improve an existing product** in a **production environment** and **record keeping**.

Example 4 - Just like Mum's Cooking (page 32)

Scenario

Experimentally extending shelf life of ready to eat meals through use of high pressure processing.

R&D Tax Incentive Principles

This example explores aspects of eligibility related to **incorporating commercially available technology**. It also provides information on **record keeping** and **Research Service Providers**.

TABLE 1 · This table demonstrates a range of relevant issues for companies and their treatment in each of the examples

KEY CONCEPT	**EXAMPLE 1A** Green To Grow Part 1	**EXAMPLE 1B** Green To Grow Part 2	**EXAMPLE 2** OzzieBugs	**EXAMPLE 3** BakingStuff	**EXAMPLE 4** Just Like Mum's Cooking
Core activity	■	◆	◆	◆	◆
New knowledge	◆	◆	◆	■	■
Supporting R&D activity	●	■	◆	■	◆
Supporting R&D activity and the dominant purpose test	●	■	◆		
An example of an ineligible core or supporting activity			◆		
Record keeping	■	◆	◆	◆	◆
Advance/Overseas Findings		■			
R&D in a production environment	◆	◆		■	◆
Transition from R&D to normal production				◆	
Transitions through different phases in the development lifecycle			■		
Existing product improvement				■	
Implementation of technologies or equipment					■
Market research			◆		
Reproducing commercially available products – exclusion from being a core R&D activity				◆	
Research Service Providers			◆		■
Feedstock	●	●	◆		

■ Concept explored in the example and an expanded explanation given in the commentary

◆ Concept explored in the example

● Concept explored in the commentary section

Note that the following issues are administered by the ATO:

- Feedstock adjustment
- Clawback adjustment

Example 1a: Green to Grow part I

This example illustrates the application of key legislative requirements for eligible R&D activities as they apply to relevant activities in an agricultural production environment.

These include the concepts of:

- **experimental activities that are conducted for the purpose of generating new knowledge,**
- **systematic progression of work** leading from **hypothesis** to **experimentation**, and
- why the **outcome cannot be known or determined in advance**.

This example also shows how by keeping good records right throughout the project, the company:

- is better placed to provide clear descriptions of its R&D activities in its registration application,
- reduces its compliance costs and risks if it were to be selected for a review in the future, and
- helps to ensure that its project is well managed, efficiently carried out and that knowledge is captured.

Business scenario

Green to Grow Pty Ltd is a large agricultural company with sites around Australia that grows green leafy vegetable crops for domestic and international markets. In recent years Green to Grow's crop yields have been lower because of reduced rainfall and shortages of irrigation water at their New South Wales and Queensland sites.

Green to Grow's CEO, noting the reduced rainfall, competing demands on water resources and increasing global demand for food, undertook a review of the company's water resource management strategy. The review identified a critical and urgent need to optimise the use of the company's irrigation water resources. As a consequence, the company undertook to investigate whether the custom installation of a new to market modular watering system, able to soak the roots of the plant while determining the most effective timing and frequency of watering, would improve yields with reduced water usage. The modular watering system was selected on the basis that it delivered large droplets close to the ground which reduced the amount of water lost to the atmosphere during watering. The company knew that simply installing an existing system, even if new, would not require R&D. However, the company's agronomists had an idea that they could manipulate the planting density when using the new watering system, with a view to using the crop canopy to shade the roots and act as a physical barrier to further reduce water lost to evaporation. The company believed that an effective planting density strategy would perform this function, but also knew that planting the crop too densely would limit the growth of the plants.

The company decided to use the existing watering system, growth rates and production yield data at its South Australian site (which was not affected by drought) as controls for the NSW and Queensland experimental activities. This would ensure the company received useful data to evaluate should the test crops receive low

rainfall. Green to Grow embarked on a farm improvement project with the following business objective[6]: 'the yield of the green leafy vegetable crop can be improved with a lower overall water allocation by the installation of the new modular watering system and by determining the most effective watering routine and planting density.' In order to access the R&D Tax Incentive, Green to Grow first needed to assess the eligibility of its proposed R&D activities. This involved assessing and classifying the activities carried out in the project into activities that were not R&D activities, and activities that met the legislative requirements for R&D activities - eligible core and supporting R&D activities. Once this was completed, the company was able to register its R&D activities with the department. In the course of this self-assessment the company decided it would register one core R&D activity, as it believed it would be able to substantiate that the whole of that activity met all of the requirements for a core activity.

What were the activities in the project? *Activities that were R&D activities, and activities that were not.*

The selection and installation of the watering system across the whole farm area were not R&D activities.

Existing knowledge was that the watering system was efficient, and the company was using it for the purpose it was designed and sold. While the company did not know what the specific water use and yield using the system would be until it had installed and used it, installing the system and observing yields did not generate new knowledge. In fact it installed the system across the whole farm because it knew that yields would improve with water use reduced, based on the existing knowledge about the system.

However in addition to the use of the watering system the company had an idea that its plants could be planted at a high/er density with the new watering system to gain additional water saving benefits while maintaining crop yield. The crop plants they were using were known to be sensitive to close planting. Their roots tangled and competed, the plants yellowed and yields fell quickly if they were close planted. However the company's chief agronomist was keen to try an idea that the very effectively targeted watering of the new system could change that growth pattern in close planting, while further saving water through better canopy shading of the root zone. The Company's agronomists considered their existing knowledge, undertook literature searches, contacted colleagues and academics to find out whether they could determine whether it would work. However, the existing knowledge for this and related species was limited and indicated that close planting performed poorly under all watering conditions. However, because of the limited information on the topic, the company still believed it worth a try, but recognised that it was necessary to experiment. The unknown outcome meant that this could not be risked on whole farm. They designed the experiment with test plots and the controls in SA which had variations of watering regime on similar densities in test plots.

[6] Note that a business objective is not the same thing as a hypothesis.

Green to Grow Project Core R&D Activity: *Testing of Planting Density Concept*

Green to Grow considered the department's guidance material on eligible R&D activities and self-assessed that testing the new watering routine and planting density strategy met the requirements to be registered as a core R&D activity. In assessing that the activity would generate new knowledge, Green to Grow had already investigated the types of watering systems that were available on the international market and assessed their suitability as a potential solution to their problem of low yields in times of low water availability. On the basis of this research, they decided that a new-to-market modular system was the only commercially available system that might fulfil their requirements. Green to Grow's desk research found that there was very limited information available about optimising watering patterns and planting densities with the new modular watering system to reduce water usage and improve yields for Green to Grow's specific crops. Green to Grow also sought expert advice on their proposal from an agricultural research institution and received written advice that the knowledge they needed was not yet known and experimental trials were the only way to deliver the answers. To ensure a systematic progression of work, Green to Grow's R&D senior horticulturalist developed the following experimental hypothesis for the project: 'a tight 250mm effective planting density with the modular watering system will grow the green leafy vegetables with less water while increasing the harvest yield.' This hypothesis formed the basis for the design of the experiments and was tested by the subsequent running, observation and evaluation of those experiments, and the logical conclusions that followed.

Commentary

Identifying Core R&D Activities. Core R&D activities are experimental activities that are conducted for the purpose of generating new knowledge whose outcome cannot be known or determined in advance. These activities must be conducted in a systematic manner and follow the principles of established science, proceeding from hypothesis to experiment, observation and evaluation, and lead to logical conclusions.

Experimental Hypothesis required

A hypothesis is a statement or proposition about what result is expected if certain conditions are put in place and certain actions carried out in an experiment or experiments. It can range from an assumption or proposition to a reasoned theory, but it must underpin the experimental activity and form part of a specific systematic progression of experimental work undertaken by the company. It must be evident that the specific experiment or experiments, the data collected and the analysis have been designed to test the hypothesis or hypotheses. If the outcome of an activity can be obtained without a hypothesis, then the activity will not be a core R&D activity.

What records and specific documentation did Green to Grow keep?

Green to Grow's research provided good evidence that the outcomes of the planting density experiments could not be known in advance. Accordingly, records of this research was kept by the company, including its literature searches, and records of discussions and advice from colleagues and academics.

The letter of advice from the agricultural research institution is also good evidence to demonstrate this claim (although this independent advice from an expert in the field is not a mandatory requirement of the R&D Tax Incentive).

To meet their obligations under the R&D Tax Incentive, Green to Grow also needed to keep documents that explained what they did in their core R&D activity, including experimental activities and documents to demonstrate that its activity proceeded in a systematic manner. Specifically, Green to Grow documented and kept documentation recording the:

- original hypothesis for the experiments and any subsequent hypotheses they needed to test,
- experimental designs, i.e. what were the experiments and how were they set up, including the control groups,
- observations of the experiments as and after they were run, i.e. the collection of the water use, evaporation rates, growth rates and total yield at the end of the trial,
- statistical analyses of the growth rates and total yields between the different sites, and
- conclusions as to whether the experiment showed that the hypothesis about planting density was correct.

By keeping these documents, Green to Grow ensured that they were 'compliance ready' – that is, their self-assessment was based on actual evidence, and if selected for a review by the department they could provide documents and show the progression of its R&D activity.

Commentary

Keeping written records of the experimental design and what you did, including your failed experiments (if any) and the outcomes, evaluations and conclusions will be necessary to help you self-assess the eligibility of your activities, and enable you to demonstrate your activities were eligible if you are selected for review by the department. These documents are generated as a natural work product of conducting an experiment.

Assessing Core R&D Activities

When establishing compliance with the legislative requirement that experimental activities involve an outcome that cannot be known or determined in advance, companies should focus on recording how they determined that existing products, methodologies or technological information reasonably available on a world-wide basis could not provide the required outcomes for their experimental activities. Participants will usually demonstrate this through undertaking and recording the results of a literature analysis or searches outside the company regarding the current state of knowledge or state of the art. In the agrifood sector this could include a broad range of information from suppliers, research organisations, industry articles, blogs, wikis, etc.

Assessing Supporting R&D Activities

Although not considered in the Green to Grow example, activities that do not form part of the core experimental activities may still be eligible as supporting R&D activities if they meet the requirements. Supporting R&D activities are directly related to an eligible core R&D activity. To be 'directly related' an activity needs to have a direct, close and relatively immediate relationship with an eligible core R&D activity. This concept is explored and explained further in subsequent examples.

There is an additional consideration for activities that are conducted in a production environment and activities that produce goods or services. To be eligible as supporting R&D activities they must also be undertaken for the dominant purpose of supporting an eligible core R&D activity.

When self-assessing whether an activity satisfies the dominant purpose test, a company should weigh up the various reasons it has for conducting the activity and then determine which of those purposes was the dominant (i.e. the ruling, prevailing or most influential) purpose.[7] The dominant purpose test also applies if the proposed supporting R&D activity is on the exclusion list from eligibility as a core R&D activity.

Feedstock

Companies may make the business decision to sell or use the immediate product of their eligible R&D activities (such as the harvest from Green to Grow's experimental trials). It is recommended that companies that do this seek advice from the ATO or a taxation professional on the application of the feedstock rules to agricultural produce.

You can access information on the feedstock rules on the ATO website at www.ato.gov.au/business/research-and-development-tax-incentive/, by phone on 13 28 66 or 13 72 86 (for tax agents).

Taxpayer Alert

The ATO and the department issued a taxpayer alert[8] in October 2015.

The taxpayer alert highlights a number of mistakes to avoid in making claims in the farming sector. It's very important that all taxpayers are aware of this and any other relevant taxpayer alerts.

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[7] Further information on the dominant purpose test is available from the business.gov.au website in:

1. *Customer Information Guide* (p 12)
2. *R&D Tax Incentive: A Guide to Interpretation* (p 20).

[8] Taxpayer Alert 2015/3 Accessing the R&D Tax Incentive for ineligible broadacre farming activities may be found on the ATO website.

Example 1b: Green to Grow part II

This example illustrates how the R&D Tax Incentive is applied where part of a new project activity is conducted overseas. This type of activity requires a company to lodge an Advance/Overseas Finding application with the department.

The business scenario and commentary describe conditions for an Advance/Overseas Finding including its four key requirements:

- the activity must be an eligible R&D activity,
- the overseas activity must have a significant scientific link to an Australian core activity,
- the overseas activity must be unable to be conducted in Australia, and
- anticipated expenditure on overseas activities must be less than the anticipated expenditure on the related eligible Australian activities.

Business Scenario

Following Green to Grow's successful R&D to develop an irrigation and crop canopy strategy that increased its overall yield, the company's CEO identified export opportunities into premium Asian markets. The CEO asked the company's Production Manager to scope proposals to maintain the quality of the produce over the longer post-harvest handling times needed to deliver to these new markets.

The Production Manager investigated technologies available to improve storage lifetimes for fresh produce and discovered that a number of products were reported to scavenge ethylene, a factor affecting the storage of fresh green leafy produce. However the available information did not include information on a solution for plants such as *Nutritious vegetablus* which produces a hormone which is known to inhibit the ethylene scavenging agent used in most produce packaging technologies. As a consequence of the specific features of the plant, there were significant unknowns that needed to be resolved.

Green to Grow further investigated technologies in the market and identified a different ethylene scavenging technology that it believed could mitigate the specific challenges presented by the storage of *Nutritious vegetablus*.

Green to Grow undertook literature reviews and consulted agricultural and food industry research institutions to find out if the *Nutritious vegetablus* hormone would inhibit this technology. The company was not able to find an answer to its questions despite its investigations. Green to Grow decided to look further at the technology with the view to conducting its own experiments. Green to Grow believed this technology might be suitable on its tentative understanding of the plant hormone, the life cycle of the scavenging agent, and a new modified atmosphere protocol it had been working on. The company now turned its attention to locating a manufacturer.

Green to Grow's research failed to identify a packaging manufacturer in Australia that employed the technology. However, its research identified a potentially suitable packaging made by an overseas manufacturer.

As a result of its research and expert knowledge, Green to Grow developed a hypothesis that:

Packaging Nutritious vegetablus leaves in sachets embedded with ethylene scavenging technology agent 211C and inflated using modified atmosphere packaging (MAP) protocol A112 will extend storage lifetimes of the produce.

Green to Grow contacted the overseas manufacturer and discovered that the size and shape of the manufacturer's standard sachet products were not suitable for its specific produce.

The company decided that while the core R&D activity would occur in Australia, a supporting R&D activity (the design, manufacture and delivery of sufficient quantities of the prototype sachets) had to be undertaken overseas.

During its planning Green to Grow realised that the overseas component of its R&D project required an Advance/Overseas Finding from the department. This finding would allow Green to Grow to register and claim overseas R&D activities and related expenditure. Green to Grow was aware that it would not receive a positive Advance/Overseas Finding if the anticipated expenditure in its overseas activity was greater than expenditure incurred on the related Australian core R&D activity and its Australian supporting activities.

Core R&D Activity: *Development of new packaging process*

Working with the overseas manufacturer, Green to Grow set out to prove that the sachets with ethylene scavenging technology agent 211C would suitably prolong the storage times of its *Nutritious vegetablus* produce when combined with MAP protocol A112. A series of experiments tested the effect of five different quantities of scavenging agent 211C in the sachet films under MAP protocol A112. Results were collected during the trial including ethylene levels, modified atmosphere composition, and quality of produce across the trial storage times. Green to Grow then compared the results between the different quantities of ethylene scavenging agent 211C, MAP protocol A112, storage times and produce quality.

These experiments failed to extend the shelf life of the *Nutritious vegetablus* leaves compared with the control sample. The company examined the results and found that the composition of the modified atmosphere in the packaging and the scavenging agent had changed dramatically. After further analysis, it was decided that the problematic hormone in the plant may have interacted with a component of the modified atmosphere. The company believed this interaction produced a compound that then adversely reacted with the ethylene scavenging agent and negated its effect.

Green to Grow conducted more research and began to adjust the composition of the compounds in its MAP. The company came up with three different compositions which it used for new MAPs.

The experiments were then repeated with the three new MAPs; A113, A116 and A121.

The experiments showed that the prototype sachets with embedded agent 211C in conjunction with MAP protocol A116 provided the required improvements in storage times of *Nutritious vegetablus* produce. The company examined the composition of

the modified atmospheres and confirmed that composition in the successful experiments remained essentially the same as they had started. The experiments also showed the optimum quantity of the scavenging agent to ensure the arrival of the best quality *Nutritious vegetablus* produce for different storage times.

Overseas Supporting R&D Activity: *Development of the prototype sachets*

Green to Grow approached the manufacturer who was prepared to work with Green to Grow to develop and manufacture sufficient quantities of five prototype sachets with different amounts of scavenging agent 211C embedded in the film for the experiments.

The sachets were manufactured in five batches each with a different quantity of ethylene scavenging agent 211C in the film. The expenditure on this overseas supporting R&D activity was less than that of the Australian core R&D activity.

Green to Grow assessed this activity as a supporting R&D activity because of the need for the manufacturer to produce custom items. If the overseas company's standard product and amounts of ethylene scavenging agent embedded in the sachet film were suited to Green to Grow's needs, it could have self-assessed the sachet acquisition as an expense under the core R&D activity. However the development of the sachets that Green to Grow needed in five different concentrations involved more than an off-the-shelf purchase, and was self-assessed to be a supporting R&D activity.

What documentation did Green to Grow keep?

Green to Grow kept documentation to support its Advance/Overseas Finding application. This documentation included correspondence between several domestic and overseas manufacturers that detailed the specifications and compositions of their products. In conjunction with its documentation of the biological properties of *Nutritious vegetablus*, these documents were key evidence to support the company's claim that the overseas manufacturer's product was the only one suitable for its needs.

The company also kept correspondence showing that the domestic manufacturers were not able to produce the sachets with the scavenging agent 211 C as a bespoke order.

Further correspondence with the overseas manufacturer documented the design options to meet Green to Grow's requirements for the prototype sachets and the associated cost of designing the prototypes and delivery of the packaging materials for the Australian trial.

The overseas supporting R&D activity produced goods in the form of the prototype sachets.

Green to Grow kept documents to show that this activity was undertaken for the dominant purpose of supporting the Australian based core R&D activity. Those documents showed that the prototype sachets were only used in the experimental activities.

Green to Grow also kept documentary evidence to support its claim that the outcome of its experiments was not already available on a world-wide basis, and could not have been known before the experiments were conducted.

In relation to its R&D activities the company maintained records including documents that demonstrated a systematic progression of work that was based on the principles of established science and proceeded from hypothesis, to experiment, observation and evaluation and led to logical conclusions. The company also kept the results and analyses of its failed experiments. Green to Grow managed its R&D using a project plan, including a risk management plan, that set out the business aims and technical hypotheses, explained the design of the experiments to test the hypotheses, described the observations and analyses that resulted from each of the experiments it conducted.

Commentary

Advance/Overseas Finding

Companies wishing to register R&D activities under the R&D Tax Incentive that they plan to conduct overseas must lodge an Advance/Overseas Finding application[9]. Companies should note that an Advance/Overseas Finding Application must be lodged before the end of the income year in which the activities were conducted. As the Advance/Overseas Finding will bind the Tax Commissioner for up to three years for an Advance Finding and for the life of the activity for an Overseas Finding, the department will assess the specifics of the proposal carefully.

To enable a Finding to be made the company needs to self-assess its core and supporting R&D activities and provide detailed explanations of them. This is necessary to enable the department to understand what is planned to be undertaken overseas and how it relates to the Australian based activities. It is also necessary to provide a reason as to why the proposed R&D activity cannot be conducted in Australia. There are four allowable reasons for this under the programme:

1. Access to facilities, expertise or equipment not available in Australia or the external Territories,
2. Access to a population (of living things) not available in Australia or the external Territories,
3. Conducting the activity in Australia or the external Territories would contravene a law relating to Australian quarantine, or
4. Access to a geographical or geological feature not available in Australia or the external Territories.

Activities being conducted overseas must also demonstrate a significant scientific link to an eligible core R&D activity being conducted in Australia. Additionally, the actual and reasonably anticipated expenditure on overseas R&D activities must be less than the actual and reasonably anticipated expenditure on the related R&D activities that share the significant scientific link that are being conducted in Australia.

[9]The Advance/Overseas Finding form may be found on the business.gov.au website.

Once companies receive an Advance/Overseas Finding, they will still need to register these activities with the department. The preparation needed to complete an Advance/Overseas Finding application will help companies to register their R&D. The registration process requires activities to be classified into core and supporting R&D activities in the same way as the Advance/Overseas Finding application. Note that findings only apply if the activities in the finding are recognisably the same as the registered activities.

Dominant purpose

When self-assessing the dominant purpose of a supporting R&D activity that will produce goods it is important to have regard to the number of items that will be produced. If the goods are being produced to form part of the experimental activity in the related core R&D activity then it is expected that only sufficient numbers of the item will be manufactured to be used in the experiments, plus a reasonable reserve to replace any damaged items. For example, if it is determined that only 100 items are needed for the planned experiment and any reasonably anticipated follow up experiments then manufacturing 1,000 would suggest the dominant purpose was not to support the experimental activities.

The eligibility of supporting R&D activities is explored further in subsequent examples.

Feedstock

Companies may make the business decision to sell or use the immediate product of their eligible R&D activities. It is recommended that companies that do this seek advice from the ATO or a taxation professional on the application of the feedstock rules to agricultural produce.

You can access information on the feedstock rules on the ATO website at ato.gov.au/business/research-and-development-tax-incentive/, by phone on 13 28 66 or 13 72 86 (for tax agents).

Example 2: OzzieBugs

This example highlights how R&D activities change as a company transitions through different phases in the development lifecycle for a new product.

The example provides further insights to the description and classification of core and **supporting R&D activities** carried out in a commercial environment. It also highlights some activities likely to be ineligible and the reasons why.

This example reflects the change in focus of the R&D as it steps along the development lifecycle:

- from a selective breeding R&D project carried out by a registered **Research Service Provider (RSP),**
- to the development of a mechanism to prevent unauthorised farming of the new product, also conducted by the RSP, and
- to an R&D project to determine the optimal farming conditions.

Note: As R&D projects progress along a company's development pipeline, there is an expectation that the R&D activities that are being registered in the company's annual R&D Tax Incentive registration reflect the actual activities that are being undertaken.

Business Scenario

OzzieBugs is a Queensland based seafood company looking to expand its current export markets in Asia. The company identified a niche market opportunity to supply live Moreton Bay bugs to China, which would require commercial farming of the bugs. The company also believed that the export market opportunity would be maximised by incorporating characteristics into the bugs that were desirable to the Chinese market, such as a bright red shell and increasing the size of the bugs.

However, the company's research showed that there was not a ready solution to developing processes for selective breeding of Moreton Bay bugs for specific characteristics.

The company identified that a large amount of R&D, conducted over several phases, would be required for the opportunity to be realised. It developed a tentative multi-year R&D plan of experimental activities to progress the opportunity. The company determined that the progression from one phase of the programme to the next would be contingent on the successful completion of the previous phase of R&D.

Year one – the first phase

To begin the project, the company became involved with a Co-operative Research Centre (CRC) in a selective breeding project. The CRC was a Research Service Provider (RSP)[10] registered with the department and was familiar with the R&D Tax

[10]Information on Research Service Providers, including the contact details of current RSPs, is available on the business.gov.au website.

Incentive and able to assist the company with some of its eligibility questions and record keeping requirements.

OzzieBugs engaged the CRC to undertake its research work and incurred the resulting expenses irrespective of the research outcome. This mean that OzzieBugs was the company for 'whom the R&D activities were conducted'.

Core R&D Activity: *Development of larger bugs*

The CRC, as an expert aquaculture R&D organisation, advised OzzieBugs that its objective had not been achieved before. While selective breeding programmes tended to produce knowable outcomes, there were significant unknowns associated with the biology and life cycle of the Moreton Bay bug. This included the extremely limited knowledge of genes that code for multiple proteins which meant it was not knowable in advance whether the desired characteristics would impair the bug's reproductive or social outcomes. For example, it was unknown whether a larger bug or the expression of red colouration would also mean a more aggressive bug that was unsuitable for farming.

These unknowns meant that significant hypothesis-driven experimentation would be required in order to develop the desired characteristics in the breeding stock.

The CRC began its work with the hypothesis: The genes and biochemical mechanisms associated with increasing the body size in Moreton Bay bugs do not have a role in genetic propensity for aggression or in reducing reproductive productivity.

This hypothesis guided the selective breeding experiments which were assessed by observing and analysing the size of the resulting offspring and their social interactivity and reproductive outcomes as adult animals.

This work proceeded alongside selective breeding experiments to fix the desired characteristics that were determined in the supporting R&D activity. The experiments examined the relationships between the desired characteristics, aggression, reproductive productivity and any other adverse outcomes.

OzzieBugs considered the department's guidance material on eligible R&D activities and, with the help of the CRC, self-assessed that because of the significant unknowns, the activity to develop larger bugs with special characteristics was a core R&D activity.

Supporting R&D Activity: *Research into Chinese market preferences*

OzzieBugs self-assessed that the research conducted into Chinese market preferences used to guide the experimental development of the characteristics of the breeding stock was a supporting R&D activity. OzzieBugs knew that its research was directly related to the core R&D activity (which could not be completed without the research). Although market research activities are excluded from being core R&D activities under the programme, if the activity complies with the dominant purpose test, excluded activities can still be supporting R&D activities. OzzieBugs assessed its reasons for conducting the research and concluded that its dominant (i.e. the prevailing or most influential) purpose was to support the core R&D activity of selective breeding. Without knowing these preferences, the company could not have

designed the experiments to generate the knowledge of if, and how, to breed the preferences into the bugs.

Supporting R&D Activity: *Maintenance of tanks*

The maintenance of these tanks was directly related to the core R&D activity in that the bugs grown in the tanks were only used for experimentation and did not have a commercial purpose.

As this supporting activity produced goods (bugs) that could potentially have been used for another purpose, OzzieBugs needed to demonstrate that the activity was conducted for the dominant purpose of supporting the core R&D activity. To do this, the company was careful to document the usage of the bugs in the experiments and show that none were used for commercial purposes. In documenting the usage, the company maintained records that quantified the number of bugs being produced, the number used in experimentation and the number being disposed of as not suitable for experimentation.

Commentary

Research Service Providers (RSPs)

RSPs help small to medium-sized companies identify and gain access to expert R&D resources in particular fields. Collaborating with RSPs enables companies to conduct R&D activities without having to invest in the specialist staff or infrastructure needed to support such activities. If a company engages an RSP to perform R&D activities, it can claim an R&D tax offset for eligible expenditure on registered R&D activities, even where its total claim is less than the usual threshold of $20,000 in an income year.

Core and Supporting Activities

OzzieBugs could have chosen to sell or use the bugs that were not suitable for experimentation rather than dispose of them. Companies may make the business decision to sell or use the immediate product of its eligible R&D activities.

It is recommended that companies that sell or use the immediate product of their registered R&D activities should seek advice from the ATO or a taxation professional on the application of the feedstock rules.

You can access information on the feedstock rules on the ATO website at ato.gov.au/business/research-and-development-tax-incentive/, by phone on 13 28 66 or 13 72 86 (for tax agents).

OzzieBug's self-assessment of its dominant purpose for conducting this activity (the maintenance of tanks) was to support the core R&D activity that aims to selectively breed desired characteristics into bugs. Selling the unsuitable bugs would not in itself change this dominant purpose. However, the company would need to remain vigilant and monitor its dominant purpose for conducting this activity as it proceeded. If the dominant purpose became commercial sale then the activity would cease to be an eligible supporting R&D activity.

Selective breeding activities tend to produce predictable outcomes. OzzieBugs selective breeding activities were eligible as a core R&D activity only while there was a reasonable belief that the desired characteristics might be genetically or

biochemically paired with undesirable characteristics. Once it was established that these relationships did or did not exist then the outcome of the selective breeding activities became knowable to a competent professional in the field of aquaculture. At this point the activities ceased to be eligible as a core R&D activity.

Year two – the second phase

After successfully completing the first phase of activity over twelve months, OzzieBugs entered the second phase of its R&D project. In this phase the company engaged the CRC to investigate ways to prevent the optimised bugs from being farmed by unauthorised parties. This was important to its commercial plans as OzzieBugs intended to supply the bugs to market in a live state and wanted to ensure that its overseas competitors were not able to farm the bugs in competition.

Core R&D Activities: *preventing unauthorised breeding*

Following a programme of work, the CRC were successful in engineering a critical development point into the bug's embryological development. This critical point meant that if the bug embryo did not develop in iodine rich water to the age of two months it would not go on to develop viable reproductive organs. The sterile bug would still grow to its full size and would be otherwise unaffected by the critical developmental point modification.

OzzieBugs self-assessed that the research being conducted into the experimental development of the critical point was a core R&D activity. The CRC advised OzzieBugs that it needed to conduct a series of experiments to identify the gene in the bug's genome that mediated reproductive organ development.

The company also self-assessed that the second activity of creating the critical development point through epigenetic experimentation on the bug's genome was a core R&D activity.

Supporting R&D Activity: *maintenance of tanks*

Each of the two core R&D activities were directly supported by the maintenance of reproductive and growth tanks that raised the bugs for core R&D activity experimentation. The maintenance of these tanks was directly related to the core R&D activities in that the bugs to be used were grown in them. As in the first year phase, because this activity raised bugs (that is, it produced goods), the company also needed to demonstrate that it was conducted for the dominant purpose of supporting a core R&D activity.

Year three – the third phase

Having successfully completed the first and second phase, OzzieBugs embarked on the third phase of its commercial endeavour with a new R&D project. This project involved experimental activities to determine the farming conditions to maximise the productivity of the new bugs.

OzzieBugs was by now confident with its understanding of the R&D Tax Incentive and self-assessed the following core and supporting R&D activities.

Core R&D Activity: *control of biofouling in ponds*

The company found that the micro and macro biofouling in ponds needed a non-chemical based mechanism to control epibiosis in the farming ponds. The company favoured a fast acting and clean plasma and acoustic pulse technology that would be used following harvest and before the next larvae stock were introduced into the ponds. The effectiveness of this treatment needed to be experimentally tested.

OzzieBugs research demonstrated that the use of energy pulses in anti-biofouling had not been tried in the ecosystem that the bugs would be grown in and the effectiveness of the method was unknown on the endemic biofouling agents. Consultations with the CRC confirmed the company's views that independent experts were not able to advise it on the effectiveness of endemic biofouling agents without conducting experiments.

Core R&D Activity: *developing suitable feed*

The rationale for this part of the project was that one of the Chinese market characteristics introduced into the bugs in the first year was a thin shell that was bright red in colour. This meant the bugs would not need as much calcium in their feed and would need more red algae meal to impair the production of the crustacyanin proteins to make the shells red. Uneaten portions of these materials would increase the amount and rate of biofouling which would have an adverse effect on the health of the bugs. As the correct biofeed composition and daily feeding quantities were unknown in respect of the new bugs' characteristics, and the CRC as an independent aquaculture expert organisation was unable to advise the company of a solution, OzzieBugs needed to conduct an experimental activity to solve its problem.

The company then undertook core R&D activities and recorded its hypotheses, experimental methodologies, observations and evaluations, and logical conclusions. This documentation ensured the company was 'compliance ready' by enabling the company to show that the activities complied with the requirements for core R&D activities under the R&D Tax Incentive.

Supporting R&D Activities: *management of water quality*

These activities were self-assessed by OzzieBugs as supporting R&D activities as they were not experimental but were directly related to the core R&D activities.

The management of factors that affected the survival rates of the bugs was critical to the project. Without this knowledge the effectiveness of the biofouling and aquaculture feed experimental activities would be in doubt as the experimental outcomes would be confused with general water quality effects such as growth impairment by excessive nitrates or ammonia in the water.

The cost of pest and parasite removal, cleaning and maintaining the ponds during the course of the experimental activities to determine the optimal conditions for farming bugs, was directly related to the core R&D activities and was, therefore an eligible supporting R&D activity.

What documentation did OzzieBugs keep?

Because OzzieBugs wanted to ensure it made the most of the R&D, it was careful to record the details of its experimental methodology, results and evaluations.

As a result, the company already had all of the information it needed for its R&D Tax Incentive registration. OzzieBugs retained documentation that outlined the programme of work and related technical milestones for the development lifecycle to meet its commercial objective. This included documentation of all of the experimental activities including the hypotheses, methodology, observed results, evaluations and conclusions. Any subsequent revisions to the hypotheses and experiments that resulted were also recorded.

OzzieBugs recorded correspondence with the CRC. This documentation demonstrated the CRC advised the company where it needed to conduct research programmes to solve problems.

The company also kept documentation of the growing ponds, including the growth and survival rates of the bugs in each pond and conditions of the water. This information was supplemented with records of the aquaculture feed type and daily feed rates.

Commentary

Ineligible core or supporting activity: *construction of ponds*

As outlined above, activities which do not form part of the experimental activities may be eligible as supporting R&D activities. This means that companies may claim expenditure on supporting R&D activities that are directly related to an eligible core R&D activity. An activity is directly related if it has a direct, close and relatively immediate relationship with a core R&D activity. Supporting R&D activities in a production environment must also be undertaken for the dominant purpose of supporting the core R&D activity.

OzzieBugs assessed that the building of growing ponds was neither a core nor supporting R&D activity. The building of growing ponds was not a core R&D activity because there was no unique feature of the ponds that would be trialled for the first time or would be considered new knowledge that could not be known or determined in advance.

After applying the dominant purpose test, OzzieBugs also decided that building the ponds was not an eligible supporting R&D activity. The company decided that the dominant purpose of the construction of the ponds was for ongoing commercial production. Essentially, the company determined that the ponds would only be used for experimentation for a comparatively short period and that its dominant purpose would be for production. If the company had constructed a specialised ‘experimental’ pond, which had significant additional features that aided the experimental activities and was only to be used during the experiments, then the construction of the pond would likely be accepted to be for the dominant purpose of supporting the core R&D activities.

Example 3: BakingStuff

This example examines some of the issues for small to medium agrifood companies conducting R&D activities to experimentally improve an existing product in a production environment.

The scenario addresses the following topics:

- **New Knowledge,**
- R&D incorporating '**whole of production**',
- **Transition from R&D to normal production,**
- **Improving and existing product,**
- **Registration** of R&D activities, and
- **Record keeping.**

Business Scenario

BakingStuff Pty Ltd is a small family-run company that produces specialised bread products.

To improve the health benefits of its product, BakingStuff decided to enter the next generation 'functional food' market by introducing fish oil to its wholegrain bread line. To prevent the strong flavour of fish oil from dominating the taste of the bread, BakingStuff planned to use an existing microencapsulation technology which released the oil only once it entered the digestive system.

Although microencapsulated fish oil had been commercialised for use as a food additive, BakingStuff found little information in the public domain on how to add it to processed foods. The company consulted its industry peers in Australia and around the world and contacted academic research institutions. BakingStuff's research found that information existed on how to add the technology to dry foods but not to a wet food mix like bread dough. As a result it concluded that it needed to invest time and resources and conduct its own R&D.

In its research, Baking Stuff discovered that a large bakery had already commercialised a similar product using this technology but did not and would not make the knowledge behind it publicly available. Although the knowledge existed, it was not available to BakingStuff so that the outcome of any experimentation by it on its product line could not be known or determined in advance. It should be noted that any activity related to the reproduction of a commercial product or process from (among other things) publicly available information cannot be a core R&D activity.

BakingStuff initially hypothesised that:

The introduction of 20 grams of encapsulated fish oil additive would not affect the current recipe or production process.

However, soon after beginning the experimentation the company found this hypothesis to be incorrect and had to devise further experiments to develop a recipe that successfully incorporated the additive without affecting the bread's organoleptic properties. BakingStuff developed additional hypotheses to guide related R&D activities as it further investigated the use of the additive.

Core R&D Activities:

1. Development of a totally new recipe to produce wholegrain bread that had the nutritional benefit, but not taste, of fish oil on a commercial scale.
2. Systematic testing of the wholegrain loaf in elevated temperatures, such as those experienced during transportation to market (e.g. seasonal conditions).
3. Development of a totally new recipe to produce a fruit loaf that had the nutritional benefit, but not taste, of fish oil on a commercial scale.

BakingStuff's series of experiments observed and evaluated:

- the stability of the additive when mixed with abrasive whole grains,
- dispersion of the additive evenly throughout the mixture, and
- the effects of storage temperatures on the breakdown of the capsules and release of oil over time.

The initial experiment resulted in the clumping of ingredients and undercooked dough and disproved the original hypothesis. BakingStuff then conducted further hypothesis-driven testing that initially focussed on altering the mixing speeds and times. The company eventually found that mixing speeds, baking times and temperatures needed to be altered in order to successfully introduce the fish oil.

The experiments progressed from individual loaves to full-scale production to test the unknown impact of a stronger, mechanical mixing action and mixing times to ensure adequate dispersion of the additive in a large batch of ingredients. Baked bread loaves from the full production run were randomly sampled to test the consistency of the dispersion as well as the stability of the additive across the larger sample size. This series of experiments focused mainly on the impact of altering the mixing times and speeds of the larger mixing equipment.

The early experimentation failed, however BakingStuff analysed these failures to understand how the variables were interacting and developed new hypotheses to test these understandings. Each failed experiment generated more new knowledge which allowed the company to design further experiments until it succeeded.

Once BakingStuff was satisfied that it had successfully introduced the fish oil to the bread without affecting the quality of the loaves or the integrity of the additive, it then wanted to test the cooked loaves in elevated temperatures similar to those experienced during transportation, particularly in summer. To test the heat resilience of the new loaf the company loaded packaged loaves onto transport trucks in the same manner as it would for regular deliveries. Loaves were transported during summer to one of three different destinations representing a short, medium and a long trip. The company used a matrix of thermocouple nodes and logged temperature readings throughout the transport for subsequent analysis as this might assist in better developing future transport logistics. The company tested the integrity of the additive in the loaves on arrival at each of the three different destinations and each day after arrival for a total of five days.

BakingStuff used 20 per cent of a normal production run to supply the loaves that would be used in the transport experiment and registered that as a supporting R&D activity, while the remaining 80 per cent was distributed locally for sale as normal.

Following the successful introduction of the fish oil into the wholegrain bread, BakingStuff decided to apply it to both its fruit loaf and white loaf. The company was

able to use the expertise generated through the previous trials for the white loaf where there were no abrasive ingredients, but trials were conducted to investigate the effect of fruit enzymes released during the mixing process on the additive.

The experiments for the wholegrain and fruit loaves were similar in that they were testing the unknown effect of the additive on abrasive ingredients. The fruit loaf also involved uncertainty of the interaction of the enzymes in the fruit with the encapsulated fish oil additive. However, once the additive had been successfully added to the wholegrain loaf, BakingStuff self-assessed that it had generated enough expertise to only need to test the specific fruit-related aspects of the new product.

Supporting R&D Activities

1. Initial research into the introduction of microencapsulation technology to a wet mix.
2. Baking of the sample loaves to test endurance under transport heat conditions (at this point, the introduction of the fish oil to the loaves had been successful and the experiment related only to the testing of the bread during transportation).

At the end of the income year, BakingStuff registered three core and two supporting R&D activities for the R&D Tax Incentive.

What documentation did BakingStuff keep?

As general good business practice, BakingStuff kept business records and was able to self-assess its R&D activities using the following documentation:

- **Production run sheets.** During the R&D trials, BakingStuff added columns to its standard run sheets to record changes to ingredients, mixing times and speeds, baking conditions and taste.
- **R&D plan.** Prior to conducting any R&D activities, BakingStuff wrote an R&D plan to clearly outline the objectives of the project.
- Reports. A commercial laboratory was contracted by BakingStuff to test the level of dispersion of the fish oil in an individual loaf and also across a full scale production run. The laboratory compiled the results in a series of reports that were provided to BakingStuff.

Commentary

R&D incorporating 'whole of production'

The introduction of the fish oil encapsulation was originally done on small scale individual loaf runs. However, when the experiment progressed to test the dispersion of the fish oil during a full scale production run, BakingStuff had to use its automated baking machine, which also produced four other bread batches at the one time.

BakingStuff was able to claim the production of the experimental batch as a supporting R&D activity as the dominant purpose was to directly support the core R&D activity. However, the adjoining four batches were produced for commercial purposes and were therefore not eligible as a supporting R&D activity.

When BakingStuff wanted to test the bread under changing temperature conditions experienced during transport, production of the bread had become part of normal

production as it had ceased to generate new knowledge. However, BakingStuff determined that 20 per cent of a normal production run was needed to supply bread for the temperature tests. Consequently, BakingStuff self-assessed that 20 per cent of the production run was a supporting activity as it was produced and used for the dominant purpose of experimentation and not for a commercial or production purpose.

Improving and existing product

When BakingStuff decided to apply the new knowledge to the white loaf, it self-assessed that it had gained sufficient expertise in the handling of the additive during the experiments on the multigrain and fruit loaves that no new knowledge would be generated in developing the product. However, in the case of the fruit loaf, the knowledge gap of how the fruit pieces would affect the process required experiments to resolve. Accordingly, the experiments that related to the mixing and baking times for the fruit loaf were eligible core R&D activities.

Note: if BakingStuff had identified significant unknowns around the introduction of the additive into the white loaf, it may have assessed a need for further experimentation and a new core R&D activity.

Supporting R&D activities

It is a matter for the judgement of companies as to whether an activity that is closely connected to an experiment forms part of the core R&D activity or whether it would be more correctly classed as a supporting R&D activity. When making these judgements, companies should consider how close the activity is to the experiment, its significance to the experiment and the record-keeping requirements that can substantiate their decisions.

Example 4: Just Like Mum's Cooking

This example explores some of the stages that a small company may follow to incorporate commercially available technology into existing production.

Topics covered include:

- **New knowledge using existing technology,**
- R&D incorporating 'whole of production',
- **Research Service Providers,**
- **Registration** of R&D activities, and
- **Record keeping.**

Business Scenario

Owned and operated by two chefs, Just Like Mum's Cooking (JLMC) is a small company that prepares gourmet ready to eat meals. The company began by preparing meals for busy families and boxing them for sale by local suppliers.

Encouraged by the steady growth in the ready to eat meal market, JLMC expanded business operations by increasing its production capacity. With the increased capacity, the company sought to supply larger quantities of ready to eat meals to leading retailers. During its early consultations, JLMC found that large retailers needed the meals to maintain their quality over a longer shelf life.

Accordingly, JLMC decided to improve its product by extending the refrigerated shelf life to satisfy the large retailers' requirements. During the research into available technology in this field, JLMC came across an article in a food journal about how high pressure processing (HPP) can extend the refrigerated shelf life of dairy products. Consequently, the company began exploring the idea of using the technology to extend the shelf life of its ready prepared meals.

Core R&D Activities:

1. Experiments conducted to test the effect of the HPP technology on shelf life of each ready to eat meal.
2. Experiments to redesign recipes following HPP experiments.
3. Experiments to examine HPP treatment and problematic enzymes and bacterial spores.

Although JLMC found information on the application of HPP to dairy products, it could not find any information on how to apply it to ready to eat meals and could not find any experts in the field who could give firm advice about how to apply it. Consequently, the company decided to conduct a series of experiments to examine key technical variables to discover whether the same technology could extend the shelf life of its meals without affecting food quality.

As JLMC didn't have this type of R&D expertise, the company contracted a Research Service Provider (RSP) that was a specialist in the field of HPP technology. JLMC found the RSP through the business.gov.au website and together they reviewed JLMC's R&D plan against the R&D Tax Incentive programme to assess whether the planned activities were eligible. JLMC was grateful for the

assistance of the RSP but acknowledged that JLMC was ultimately responsible for the claims under the programme.

JLMC provided a range of meals to the RSP, who tested the effect of HPP on the shelf life of the product. The first tests trialled the HPP with a hypothesis that the HPP could be applied as a direct replacement to conventional shelf life extension agents. After applying the HPP, the RSP tested the quality of the HPP-treated meals for their taste, texture, nutrition and appearance.

The first experiments found that the sweetness of the each of the meals increased significantly after HPP and that only some meals had their shelf life extended. Following further research and hypothesis-driven testing the RSP discovered that the HPP process amplified sweetness generally and failed to deactivate some enzymes and bacterial spores. Consequently JLMC had to revise its recipes to reduce sugars and replace or reduce the content of ingredients that were the source of the problem enzymes. The bacterial spore problem was overcome by using the HPP at a moderate pressure for five minutes before moving to a high pressure for two minutes.

After the experiments were completed, JLMC decided that it would incorporate HPP into its production to meet the shelf life requirements of the large retailers. The experiments showed it how to do this without sacrificing the quality of its ready to eat meals.

Supporting R&D Activities:

1. Research into the HPP technology with regard to food enzymes and pressure resistant bacteria.
2. Produced sample meals for the RSP to use during experimentation.

In addition to the experiments undertaken into HPP-treated meals, JLMC and the RSP undertook activities that supported the core R&D activities. These activities included JLMC's production of meals for the HPP experiments and the research that the RSP needed to undertake to better understand the problematic food enzymes and pressure resistant bacteria. JLMC's meal production activities were self-assessed as directly related to the core R&D activity as the meals that were produced and claimed were essential to the HPP testing. The RSP's research was self-assessed as directly related because it specifically informed the HPP experimentation as it attempted to overcome those issues.

What documentation did JLMC keep?

Prior to the R&D project, JLMC did not have a formal record keeping system in place. During the R&D planning phase, the company recognised the need to keep records as part of good business practise and also to support its R&D Tax Incentive application. To avoid having to go back and look for its records at the end of the project, JLMC noted the need to keep and file the following records carefully:

1. **Emails.** JLMC saved a record of its correspondence with the RSP, including the R&D plan for conducting trials.
2. **R&D plan.** JLMC, together with the RSP, developed an R&D plan prior to conducting the experiments which provided direction and purpose for the R&D project. The plan included information on the rationale for undertaking the project,

how the project would enhance the commercial success of the company, a statement of the technical objective, time lines and a statement of the resources allocated to the project, including budgeted funding for personnel, plant and facilities necessary for the project.

3. **Reports.** The RSP provided JLMC with a detailed report on the trials conducted. The report also included more specific details on the equipment modification and staff training programme.
4. **Recipe reformulation.** JLMC maintained and kept records of its recipe reformulation including the changes to the ingredients and preparation methods. The company also maintained and kept records of its evaluations of those recipes as they were developed.
5. **Production run sheets.** JLMC kept a record of the production runs that were used to supply the meals for the experiments. This supported the quantity of meals claimed as being prepared for the dominant purpose of testing.

Keeping these documents ensured that JLMC was compliance ready and would be able to work with the department if selected for a compliance review.

Commentary

New knowledge using existing technology

The HPP technology was in existence and being used in the food industry to extend the shelf life of dairy food products. JLMC took that relatively new technology and applied it to new food products to test outcomes that could not be known or determined in advance.

The work undertaken by JLMC and the RSP went beyond mere commissioning activities of installing and learning how to use equipment for its intended purpose. The company needed to overcome significant unknowns that required systematic experiments to overcome specific technical challenges and generate new knowledge.

Registering R&D activities

JLMC's R&D project took six months to complete from February to August of the same year. Companies need to register activities annually after the end of each income year in which the activities were conducted. Companies have a 10 month window in which to lodge their registrations after the end of their income year. As JLMC operated on a July to June financial year, it was required to register activities in both financial years.

Using a Research Service Provider

At the end of the first financial year, JLMC had recognised that the project would require experimental testing and had engaged an RSP. It developed an R&D plan identifying a cost of less than $20,000 per year. Because JLMC had engaged an RSP to perform R&D activities, it can claim for eligible expenditure on registered R&D activities under the programme, even though the total claim was less than the usual threshold of $20,000 in one income year.

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