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Project title

IN FRANCE - EXAMINING THE CURRENT AND FUTURE IMPLEMENTATION OF STANDARDS AND EU LEGISLATION

MAFF

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Research and Development

Final Project Report

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A STUDY TOUR OF ORGANIC POULTRY PRODUCTION

Project title	A STUDY TOUR OF ORGANIC POULTRY PRODUCTION IN FRANCE - EXAMINING THE CURRENT AND FUTURE IMPLEMENTATION OF STANDARDS AND EU LEGISLATION									
MAFF project code	OF0303									
Contractor organisation and location	ADAS Gleadthorpe Research Centre, Meden Vale, Mansfield, Notts, NG20 9PF									
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Executive summary

Introduction

There have recently been major changes in the regulations governing the production of organic poultry products in the EU. Member States have been required to set Standards for production that meet the minimum set in Regulation (EC) 1804/99 if products, including poultry, are to be sold as organic within the EU. This has raised concerns over consistency of implementation in other Member States, and whether, directly or through derogation, this might lead to competitive advantage over the UK.

MAFF were aware that France had drafted derogations in accordance with Regulation (EC) 1804/99, and intended to implement some aspects of the Regulation which were claimed to be more stringent than the basic requirements.

The aim of this project was to establish any differences between France and the UK, in the interpretation of Regulation (EC) 1804/1999, the application of derogations within the standard and to assess whether there was likely to be an effect on the competitiveness of UK organic poultry production.

Objectives

The objectives of this study, applied to table poultry as well as organic egg production, were;-

- To gather information on the implementation of current organic poultry Standards in France, national derogations to Regulation (EC) 1804/99, aspects of the national Standards which are more stringent or impose additional constraints above those required by the EU regulation, and the timescale by which French producers are required to be fully compliant.
- To gather information on production techniques commonly used by organic poultry producers in France, and to compare these production techniques with those generally used in the UK.
- To gather information on economic 'drivers' affecting the direction and speed of development of organic standards and their application in the industry.
- To gather information on the attitudes and concerns of representatives of breeders, producers and certification bodies to future EU requirements to rear pullets within an organic system.
- To determine the extent of any ongoing research on organic poultry production in France, funded by official bodies, industry or trade organisations.

Methodology

The project comprised a study tour of organic poultry production in France, and was undertaken by an experienced ADAS poultry consultant. Arrangements for the study tour were made in December 2000 and the study tour was undertaken between the 8 January 2001 and 14 January 2001.

Preliminary information on French organic poultry production was downloaded from the French Ministry of Agriculture and Fisheries website. Contact was made with the French Ministry of Agriculture, the French Technical Poultry Institute (ITAVI), the two French certification bodies mainly concerned with organic poultry production (Qualite France eggs; and Ecocert -table poultry), the French Label Rouge national poultry syndicate (SYNALAF), the French Poultry Research Centre (INRA), the largest French breeder of suitable breeds (HUBBARD ISA), and four major French companies involved in organic poultry and egg production (MAS D'AUGE, FERMIERS D'ARGOAT, FERMIERS DE LOUE and TREGOR OEUFS).

Information on the French organic Standards was sought from officials, technical specialists, owners and managers in the above bodies and organisations. This included derogations, additional standards, and application on poultry farms, feed mills and packing stations; the design and management of poultry houses and associated outside runs; stock husbandry; breeding; nutrition; cereal production and manure utilisation. Further notes were taken during the visits, to augment feed specification sheets , photographs, copies of Standards, farmers guides, technical articles, information sheets and promotional brochures obtained . These varied sources of information were collated to produce the report s given below

Results

Contrasting with the rapid move into intensive housing systems in the UK after the second World War, some French producers continued to use traditional systems of table poultry or egg production. This was done mainly on small farms with flocks of a few thousand birds, driven by the French consumers demand for quality poultry products. It is therefore not hard to see the influence of French traditional production systems on the development of EU organic poultry standards. The Red Label scheme for poultry production is land-based and with the addition of organically grown and produced feed, formed a basis for organic production. Consequently, organic poultry production rapidly increased in France during the 1990s, including the export of organic poultry products to the UK to meet domestic consumer demand.

British and French organic poultry producers face many similar technical and economic challenges. In particular, some producers feel that the full implementation of the EU regulation with make organic poultry production economically unsustainable. Growth in the organic poultry sector in France has come to a halt. There appeared to be a hope that if the consequences of the new regulation were too adverse, the French authorities would consider within a couple of years, additional financial support, or 'revisit ' certain aspects of the standards.

The French Standards implement Regulation (EC) 1804/99, including several more stringent requirements. French Standards also apply several of the derogations allowed by Regulation (EC) 1804/99.

While for the most part the application of organic standards in France results in no competitive disadvantage to UK organic poultry producers, there are three aspects, related to laying hens, in which they do. These are detailed below.

- 1) Derogations under 8.5.1 of the French Standards stipulate that the effective date for "production units already notified for the purposes of organic farming" is before the <u>30 August 2000</u>, not the 24 *August 1999* as in Regulation (EC) 1804/99, the the UKROFS Standards, and in the 22 May 2000 French authorities draft organic standards for transmission to the EU. It is difficult to see how the French authorities can justify the adoption of this later date which appears to contravene Regulation (EC) 1804/99.
- 2) Application of French organic Regulations to laying hens appears to contraveneRegulation (EEC) 1274/91 on Special Marketing Terms relating to free range production. Regulation (EEC) 1274/91 requires that in order to use the term free range (or in French 'plein air') hens must have continuous daytime access to openair runs, whose grounds must be mainly covered with vegetation. Secondly, the maximum permitted stocking density in the run is one hen per 10m². The accepted practise of keeping hens in the house until 28 weeks of age in order to meet the requirement to rest outside runs for at least two months, and then stocking them in the runs at a high density (only 3 to 4 m² of run/hen), would appear to breach Regulation (EEC) 1274/91. Eggs from hens kept in this way should not therefore be sold as free range or organic in France, or exported to the UK.
- 3) The debeaking of pullets at eight to ten weeks of age as practised systematically in France would be unacceptable in the UK where beak trimming is allowed only up to 10 days of age. It is questionable whether eggs from French debeaked hens should be acceptable for export to the UK.

Details relating to Standards, derogations, certification bodies, breed choice and suitability, house design and stocking density, outside runs and pasture management, feeding issues (in particular, the ban on the use of

A STUDY TOUR OF ORGANIC POULTRY PRODUCTION IN FRANCE - EXAMINING THE CURRENT AND FUTURE IMPLEMENTATION OF STANDARDS AND EU LEGISLATION OF 0303

MAFF project code

OF 0303

synthetic amino acids), cereal production, manure usage, marketing, economics, pullet rearing and organic research are reported more fully in the attached Scientific Report.

Scientific report

OF 0303

1.0 INTRODUCTION

There have recently been major changes in the regulations governing the production of organic poultry products in the EU. Member States have been required to set Standards for organic poultry production that meet the minimum set in Regulation (EC) 1804/99 (published on the 19 July 1999), if poultry products are to be sold as organic within the EU. Regulation (EC) 1804/99 supplements Regulation (EEC) 2092/91 on "organic production of agricultural products and indications referring thereto on agricultural products and foodstuffs to include livestock production". While Regulation (EC) 1804/1999 covers all livestock species, this study is concerned only with organic poultry production (table chickens and layers).

MAFF were aware that France had drafted derogations in accordance with Regulation (EC) 1804/99, and intended to implement some aspects of the Regulation which were claimed to be more stringent than the basic requirements. The aim of this project was to establish any differences between France and the UK, in the interpretation of Regulation (EC) 1804/1999, the application of derogations within the standard and to assess whether there was likely to be an effect on the competitiveness of UK organic poultry production.

2.0 **OBJECTIVES**

The objectives of the study were;

- To gather information on current organic poultry Standards in France, national derogations to Regulation (EC) 1804/99, national Standards which are more stringent than, or impose additional Standards to those of Regulation (EC) 1804/99, and the timescale by which French producers are required to be fully compliant
- To gather information on production techniques commonly used by organic poultry producers in France and to compare these production techniques with those generally used in the UK.
- To gather information on economic 'drivers' affecting the direction and speed of the development of organic standards and their application in the industry.
- To gather information on the attitudes and concerns of representatives of breeders, producers and certification bodies to future EU requirements to rear pullets in an organic system.
- To determine the extent of any ongoing research on organic poultry production in France, funded by official bodies, industry or trade organisations.

The work contributes directly to MAFF policy to support the development of UK organic farming systems.

OF 0303

3.0 METHODOLOGY

The work comprised a study tour to examine the techniques used by French organic table poultry producers and organic egg producers, and to discuss with representatives of the French Ministry of Agriculture and organic certification bodies the implementation of Regulation (EC) 1804/1999 within the national Standards. Prior to undertaking the study tour a comparison was made of Standards for organic poultry production set by UKROFS and draft Standards for organic poultry production set by the French Ministry of Agriculture and Fisheries, in order to establish the main points of difference.

Arrangements for the study tour were made in December 2000 and the study tour was undertaken between the 8 January 2001 and 14 January 2001.

Preliminary information on organic poultry production was obtained from the French Ministry of Agriculture and Fisheries website. During the study contacts were made (Table 1) with the French Ministry of Agriculture, the French Poultry Technical Service (ITAVI), the two French certification bodies mainly concerned with organic poultry production (Qualite France (eggs) and Ecocert (table poultry)), the French Label Rouge national poultry syndicate (SYNALAF), the French Poultry Research Centre (INRA), the largest French breeding company (HUBBARD ISA) and four major French companies involved in organic poultry and egg production (MAS D'AUGE, FERMIERS D'ARGOAT, FERMIERS DE LOUE and TREGOR OEUFS).

Table 1. Study tour itinerary

Date	Location	Purpose of visit
8^{th}	Paris	Meeting with Franz Guerder, Isabelle Bouvarel, Veronique Gonnier, Agnes
		Laszczyk-Legendre and Ms Roquencourt of ITAVI, ECOCERT, SYNALAF
		and QUALITE FRANCE.
9^{th}	Paris	Meeting with Frederic Uhl of the French Office of Quality Signs and Organic
		Farming, Ministry of Agriculture and Fisheries.
10^{th}	Brittany	Meeting with Jean-Jaques Trevidy, Coloured table poultry specialist, Hubbard
		Isa.
10^{th}	Brittany	Visits to organic table poultry farms of Fermier D'Argoat.
11^{th}	Brittany	Meeting with Mickael Le Helloco, Brown layers product manager,
		Hubbard Isa.
11 th	Brittany	Visits to organic laying farms of Mas D'Auge.
11^{th}	Brittany	Meeting in Rennes with M. Couepel, President of Certis.
12^{th}	Brittany	Visits to organic egg unit, egg packing station and feed stores of Tregor Oeufs.
12^{th}	Brittany	Visit to see egg and poultry displays at Carrefour supermarket, St Brieuc.
13^{th}	Loire	Meeting on poultry welfare at INRA, Nouzilly.
14^{th}	Loire	Visit to Label Rouge poultry farms of Fermiers de Loue.
15^{th}	London	Meeting to give verbal report to MAFF Organic Farming Unit and FRCA.

MAFF project code OF 0303

Information was sought from officials, specialists, owners and managers in the above bodies and organisations on the French organic Standards including derogations, and their application on poultry farms, feed mills and packing stations, the design and management of poultry houses and associated outside runs, stock husbandry, breeding, nutrition, cereal growing and manure utilisation.

Notes were written during the visits, feed specification sheets obtained, photographs taken and copies of Standards, farmers guides, technical articles, information sheets and promotional brochures collected. The information was collated to produce this report.

4.0 **RESULTS**

4.1 Development of French organic standards

Differences in the recent history of production systems for poultry between France and the UK are thought to have been important in driving the speed and direction of national Standards for organic poultry production. In contrast to the rapid move into intensive housing systems in the UK after the second World War, many French producers continued to use traditional systems of table poultry or egg production. This was done mainly on small farms with flocks of a few thousand birds, driven by the French consumers demand for quality poultry products. In 1954, the first brand was established - the Loue brand of traditional poulet (growing chicken). Traditional 'low growing' breeds were used, grown to 12 to 14 weeks of age on farms close to the village of Loue, near Le Mans. The long growing period was important for meat flavour, flavour improving as birds approached sexual maturity.

Traditional poultry products increased in popularity, and this together with the traditional production of other foods, led to the establishment of the 'Label Fermier', 'Label Rouge' or Red Label system, the first of which was registered in 1960. The number of labels gradually increased, each being controlled by a certification body with strict rules approved by the government. Traditional production has continued as part of French culture and currently the number of labels is 32, covering over 400 products. The Loue brand has long had it's own Red Label and currently has 1000 producers, producing 30 million table poultry and 100 million eggs per annum. Loue is responsible for about 40% of the total Red Label poultry produced, which in turn represents 27% of table poultry consumed in France. Approximately 40% of Red Label poultry is sold through supermarkets.

The poultry Labels are co-ordinated by SYNALAF (the National Syndicate of French Poultry Labels), and SYNALAF members are also responsible for 90% of organic table poultry and organic eggs produced in France. It is not hard to see the influence of French traditional poultry production systems on the development of EU organic poultry rules. The Red Label scheme for poultry production is land-based and with the added use of organically grown and produced feed, it formed a basis for organic poultry production. Regulation (EC) 1804/99 and the French organic Standards are very similar in principle, and in some detail, to the rules of Red Label production. Since farms were already established with the appropriate type of stock, the right size of house, and approximate stocking density it is not surprising that organic poultry production rapidly increased in France during the 1990s.

4.2 Standards, certification bodies and derogations

4.2.1 Standards

The French Standards are called "Specifications for the organic production and preparation of animals and animal products laying down the detailed rules of application of Council Regulation (EEC) 2092/91, as amended, and/or supplementing the provisions of Council Regulation 2092/91, as amended". They were lodged with the Commission in Brussels in July 2000 and published in the French Official Gazette and implemented in France on 30 August 2000. It was intended that they should fully implement the requirements of Regulation (EC) 1804/99 and also set some additional Standards applicable only in France.

The French organic Standards are lengthy and complex, and so the French authorities have produced a simplified set of guidelines summarising the main requirements. This document is called the "Guide de Lecture du Cahier des Charges REPAB F".

A comparison of previous French organic Standards for poultry (Official Gazette 26/12/92), current French organic Standards for poultry (Official Gazette 30/8/00) and Regulation (EC) 1804/99 as applied to poultry was recently made by researchers at the Institute Technique de l'Aviculture (ITAVI). The information produced is helpful because UKROFS Standards and Regulation (EC) 1804/99 are identical on many points Therefore the comparison of current French organic Standards and Regulation (EC) 1804/1999 forms a basis for comparison of French and British Standards. The findings are published in French in Tendance des Marches (ITAVI) in October 2000 (an English translation is available).

4.4.2 Certification bodies

Although there are six licensed organic certification bodies in France they do not have their own Standards, and all uniformly apply the French Standards as described above. In the UK organic certification bodies set their own Standards using UKROFS Standards as the minimum.

Table 2. French organic certification bodies (on 25/11/2000)

Code	Name	Comments
FR-AB 01	Ecocert Sarl	The largest, controlling only organic farms including most of the poultry
		meat producing farms. It does not control any Label Rouge farms.
FR-AB 02	Qualite France	The second largest, controlling mainly organic egg producing farms. It
		also controls Label Rouge egg producers.
FR-AB 06	Ulase	Controls only a few organic poultry farms.
FR-AB 07	Agrocert	Controls only a few organic poultry farms.
FR-AB 08	Certipaq	Does not deal with poultry.
FR-AB 09	Aclave	Only recently formed, controlling very few poultry farms as yet

Fees for certification vary but they are generally about 1% of the wholesale product price. Qualite France charge FRF 2500 (plus fees for sample analysis) per laying house per Annum. The fee for table poultry units is about 10 cents per kg live weight.

NB. AB is the official abbreviation for Agriculture Biologique, meaning organic farming. It is used in the official logo found on organic products (see Figure 1). Most farmers use the abbreviation 'Bio' for organic.

The standards of management applied by French producers are checked at intervals by inspectors from French organic certification bodies who call without notice about once a crop for table poultry units (where generally about 3.5 crops are grown per annum) and once or twice a year for egg production units. Since one certification body, Ecocert, deals mainly with table poultry and another, Qualite France, deals mainly with pullets and laying hens, the standards appear to be applied reasonably uniformly.

4.2.3 Derogations

There is provision within Regulation (EC) 1804/99 for Member States to authorise derogations to some of the Standards set for organic poultry production for a transitional period expiring on 31 December 2010. For example, Member States may derogate on the Standards set for poultry buildings, flock size, stocking density and access to pasture provided that the poultry buildings to which they apply were constructed before 24 August 1999, and complied with the national rules concerning organic poultry production in force prior to that date. In the UK, UKROFS has allowed derogations to the Standards set for flock sizes and stocking densities for a transitional period expiring on 24 August 2005. Derogations can only be applied to livestock producing holdings which complied with UKROFS standards in force which were registered as organic prior to 24 August 1999.

A few examples of French derogations within Regulation (EC) 1804/1999, demonstrating more stringent and less stringent aspects of the Standards are given below. There are many more examples, but these are considered under the appropriate subject headings. Note that the Reference numbers are the section/paragraph numbers given in Regulation (EC) 1804/99 Annex I, part B, and they are the same as those given in the French Standards and in UKROFS Standards.

A complete list of both derogations allowed, and additional standards applied in France is available in "Comparative Tables of the EU Regime and the Member State System (Annex 1, part B of Regulation (EEC) 2092/91) - Member State: France".

Flock size and stocking density (Reference 8.5.1)

In the case of laying hens on agricultural holdings which were certified as organic before 30 August 2000, the maximum flock size per house can be 4500 (compared with the specification in the Regulation (EC) 1804/1999 of 3000) and the maximum stocking density within the house can be 9 hens/m² accompanied by at least 18cm/hen of perch length (compared with the specification in Regulation (EC) 1804/1999 of 6 hens/m²) until 24 August 2005. Batches of poultry introduced prior to 30 August 2000 benefit from a derogation from the requirements on house density, e.g. laying hens could be housed at up to 10 hens/m² with at least 15 cm of perch length/hen. For both table poultry and laying hens, in units certified as organic before 30 August 2000, the requirements of the last column (density on outdoors area) of the table at annex VIII.2 (where is this) do not apply until 31 December 2001

An important point regarding the timing of the derogations allowed under 8.5.1 of the French Standards is that the effective date for "production units already notified for the purposes of organic farming" is before 30 August 2000, not 24 August 1999 as contained in Regulation (EC) 1804/99, the UKROFS Standards, and in the 22 May 2000 French authorities draft for transmission to the EU. It is difficult to see how the French authorities can justify the later date which appears to contravene Regulation (EC) 1804/99.

Co-operating farms (Reference 7.4)

The French Standards require that holdings engaged in organic farming may only establish co-operation (on manure usage) with other holdings or enterprises which also conform to the Regulations. Critically, the word 'only' has been added, raising the requirements above Regulation (EC) 1804/99 and UKROFS Standards.

Open air runs (Reference 8.4.5)

Referring to access to the open air runs, the word half of their lives has been substituted for one third of their lives. Only the latter is required by Regulation (EC) 1804/99 and UKROFS.

Minimum age at slaughter (Reference 6.1.9)

The requirement for minimum age at slaughter for all turkeys under Regulation (EC) 1804/99 and UKROFS Standards is 140 days. The French Standards have retained this requirement for whole turkeys but have reduced it for those intended for cutting-up to 101 days for females and 126 days for males. There is no indication that they use slow growing strains for cutting-up.

4.3 Breed Choice and Suitability

4.3.1 Table poultry

There is a wide choice of breeds that are readily available from at least two breeding companies in France (Hubbard Isa and SASSO). Many of the breeds are suitable for use in organic production, and they are slower growing than modern broiler hybrids. The 'slow growing' breeds have coloured feathers and may have either white or yellow skin over the breast, and white, yellow or black pigmentation on the legs and beaks, and feathered or naked necks. Some have very smooth delicate skin and this affects the crispness when cooked.

Because the organic and Label Rouge market is mainly for a bird weighing about 2.2 kg at slaughter, with good flavour and high dark meat yields, most birds are grown to between 81 and 88 days. The strains used in French organic table poultry production are considered to be 'slow-growing'.

A more stringent requirement in French organic production is that of identification so as to ensure the traceability of each bird. Table poultry must be individually identified by marking with a tamper proof ring or band no later than five weeks of age (Reference 6.3.1. and chapter 3.1.b.). In practice, a wing band is fitted permanently using special pliers when the birds are about 10 days of age. This is the most convenient time because chicks have lost their down and have not yet become feathered (Figure 2).

The wing tag must have the letters AB and the code of the certification body (Table 2) on one side, and the name of the producer and the batch number on the other side. The wing tags remain in place at processing and until purchase, thus providing traceability from farm to consumer.

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One special category is organic capon production. Capons are grown once a year for the Christmas market. Capons are more popular with French consumers than either turkeys or geese. There are no specific breeds for capon production, but the male birds are surgically castrated at an early age. Surgical caponisation is justified on the basis that it ensures product quality and maintains traditional production practices (Reference 6.1.3). It is similarly allowed under the UKROFS Standards, but is illegal in the UK under The Welfare of Livestock (Prohibited Operations) Regulations 1982 (SI 1982 No. 1884).

4.3.2 Laying hens

No special breeds are used for organic egg production. About 90% of the laying hens in all production systems in France are ISA Brown hybrids and organic free range is no exception.

4.4 House design and stocking density

4.4.1 Table poultry

Most houses are fixed and have a usable area of about 400m². Since the stocking density is commonly around the allowed maximum of 10 birds/ m^2 , the houses hold approximately 4000 birds from day old to slaughter, at between 81-88 days of age. The maximum area of housing on any holding is 1600 m^2 , so the maximum number of houses per holding is four, and the maximum number of table poultry per holding is 16,000.

The French Standard is more stringent than Regulation (EC) 1804/1999 and UKROFS Standards. The wording of Reference 8.4.3, 5th indent of the French Standards being "the total usable surface area of poultry houses for meat production on any single production unit must not exceed $1600m^2$, and use must not exceed $400m^2$ of building per production site". This means that organic table poultry production is not heavily concentrated and that houses are well separated (in practice by at least 30 m).

A further additional French requirement is that only birds of the same age may be present in any one building. Furthermore for table poultry, "buildings of more than 200 m² must be separated into rooms by a sealed partition, extended outside by a separation of the grass run which birds cannot get over" (Reference 8.4.3). This does not yet seem to have been enforced by the certification bodies, but producers said that they intend to divide their standard 400 m² houses into two with a solid partition from floor to roof across the width of the houses and to erect fences to divide the runs. This will effectively halve the maximum flock size per room to 2000 birds.

Most of the fixed houses have natural ventilation with eaves inlets and a ridge outlet. The popholes are along one side of the house. The houses have littered floors, radiant brooders mounted along the side away from the popholes, a row of nipple drinkers and a row of mechanised pan feeders or a circuit of chain feeder. The litter conditions seen were rather poor, especially near to the popholes and around the feeders and drinkers, but the weather had been exceptionally wet.

No mobile houses were seen on the study tour. There are a few mobile houses occur as a small proportion in the south of France. The maximum size of a mobile house is $150m^2$, and there is a high risk of predation, since if stocking density exceeds 10 hens/m² (a maximum of 16 hens/m² is allowed), the house must remain open at night. Mobile houses kept open at night are unsuitable in many areas, because of high losses to foxes and buzzards.

4.4.2 Laying hens

All the houses seen appeared to be fixed, and similar in size (about $400m^2$) and structure to those used for table poultry. Houses certified for organic production by 30 August 2000 (a year later than allowed by Regulation (EC) 1804/99), have a derogation until 24 August 2005 allowing producers to keep flocks of up to 4500 hens/house at a maximum house stocking density of 9 hens/², provided that the perch space is 18cm/hen. This is similar to the position in the UK, except for the operative date which remains at 24 August 1999. For example, in the case of producers certified by Organic Farmers and Growers (certification code UK 2), flock size has been reduced to a maximum of 3000 hens and perch length requirement raised to 18cm/hen. Maximum house stocking density remains at 11.7 hens/m² until (???) flocks housed after 1 June 2001 when it will become 9 hens/m² until 24 August 2005 (I don't follow).

A further French derogation allows batches of hens introduced prior to 30 August 2000 to be stocked at a density of up to 10 hens/m² until the end of their life, so long as at least 15cm of perch is provided per hen (Reference 8.5.1).

One house visited had a usable area of $415m^2$, and this was carefully checked. It held about 4500 hens at housing and so the density then was approximately 10.8 hens/m². Of the total floor area approximately 25% was litter and 75% raised timber slats over a droppings pit. This house, which was typical, had popholes along one side with the litter area adjacent. Thus, hens entered the house with wet feet directly onto the litter, which was very wet and slippery. Access to tiered individual nestboxes was from a slatted platform which had tiered perches mounted on frames over it (Figure 4). The number and length of perches were not sufficient to provide 15 cm/hen, but it is thought that, similar to the UK some of the floor slats are counted as perches. Hens living underneath the perches were soiled by manure, as were eggs laid there. In this house egg collection was by hand from a passageway along the side of the house opposite the popholes. Other more modern houses had centrally mounted mechanised communal nestboxes which remove the need for a side passage.

The Dutch and German approach to laying house design, and stocking density for organic egg production, was causing some controversy in France. Alledgedly, the Dutch and German authorities allow a density of up to 14 hens/m² on the ground floor area where three tiers of platforms above each other occupy two thirds of the house area, providing the remaining third is covered with litter, and there are 6 hens/m² on all these surfaces which constitute usable area. In the view of many French producers, the three tier system breaches the spirit (if not the letter) of Regulation (EC) 1804/99 and, they say, that it would be difficult to manage. Many French producers would rather have a stocking density of 9 or 10 hens/m² on a single level, as they have now, and wish to continue with after 2005. The Dutch, on the other hand, argue that their tiered floor aviaries meet the requirements of Regulation (EC) 1804/99, and that this arrangement will be the only economic system for organic egg production after 2005.

4.5 Outside runs and pasture management

4.5.1 Table poultry

In practice, the requirement for birds to have free access to an external run for the greater part of the day and for at least half their life, is achieved on French organic farms by brooding the birds in fixed houses and keeping them indoors until they are about 42 days old. The popholes are then opened daily for several hours until depopulation at the age of 81 days, and more often between 84 and 88 days. This, together with the empty house clean out period of at least 14 days, enables the runs to be rested for at least the required two months.

It was seen that during the winter period very few birds actually venture out onto ground, and in any case, no further than a few metres from the house (Figure 5). Thus, the runs were well grassed away from the house, but very bare and muddy close to the house, especially around the popholes. There was no indication that the land is treated in any way during the resting period (e.g. for the control of parasites, or by re-seeding) and comments by managers confirmed this. Thus, when the stock emerge from the popholes at 42 days of age they face bare land or mud. There was no evidence of the provision of feed, water or shelter outside the houses, and there were no verandas, slats or gravelled areas around the popholes and very little shelter from roof overhang.

4.5.2 Laying hens

The arrangements were similar to those for table poultry and met the requirement that laying hens must have access to an external run for most of the day, and no later than 28 weeks of age. The standard system was again of fixed houses, with popholes along one side only. Again there was no rotation of land use and there appeared to be no pasture management plan. Mixed species grazing is not allowed. The grass is occasionally cut and removed. Again there appeared to be little or no outside shelter or provision of feed or water, in contrast to the development of such facilities in the UK (Parker, Poultry World, February, 2001).

The requirement to rest the runs is met by keeping the hens in the house from the time of housing, usually at about 18 weeks of age, until 28 weeks of age. In winter the popholes are usually open from about 11am until dusk. Very few hens were seen outside (Figure 6) and those that went out soon returned bringing wet mud on their feet into the house, contributing to the poor litter condition.

In the case of both table poultry and laying hens it seemed sufficient to meet only the basic requirements of the Regulations. It is questionable whether or not the requirement that "open-air runs must be mainly covered with vegetation" (Reference 8.4.5.) was being met, unless this was interpreted as meaning that the majority of the land (not used by the stock) is well vegetated and the minority (actually used) is bare.

Both table poultry and laying hens certified as being organic before 30 August 2000 are excluded from the stocking density limits for external runs by derogation until 31 December 2001. Calculations done on the area of runs on a couple of units visited indicated that the stock had about $4m^2$ /bird in one case and about $3.2m^2$ /bird in the other. Under the derogation, both of these pasture allowances are acceptable.

An important point to note for laying hens is that the application of French organic Standards, as described above appears to contravene Regulation (EEC) 1274/91 on Special Marketing Terms on two counts. The latter Standard requires that to use the term free range (or in French 'plein air') hens must have continuous daytime access to open-air runs the ground of which is mainly covered with vegetation at a maximum stocking density of one hen per 10m². Keeping the hens indoors until 28 weeks of age in order to meet the French organic

Standards requirement to rest outside runs for at least two months, and stocking the runs at a high density (only 3 to 4 m? of run/hen), appears to breach Regulation (EEC) 1274/91 and eggs from hens kept in this way should not be sold as free range or organic.

4.6 **Poultry management**

High standards of management are required for free range production. Factors such as the control of ventilation so as to avoid excessively cold draughty conditions, turning and replenishing litter so as to keep it friable, grain feeding on the pasture so as to encourage birds outdoors and so as to encourage even pasture use, are all important.

4.6.1 Limitations on allopathic treatments

Good practice in these matters also aids parasite and disease control and is especially important in organic poultry production. Regulation (EC) 1804/99 and UKROFS Standards allow anti-parasitic treatments on prescription and one allopathic curative treatment per batch of table poultry, but in France all allopathic curative treatments, including anti-parasitic ones, are banned. French organic Standards allow two anti-parasitic treatments and one allopathic curative treatment in laying hens. Thus, there is a need for exceptionally good pasture management and litter management in organic poultry production systems. Rather poor standards of litter management were seen in France, but the visits were made in adverse winter circumstances.

4.6.2 Beak trimming of pullets for egg production

Like UKROFS Standards, the French Standards do not allow debeaking to be carried out systematically in organic farming. However, debeaking is carried out in France on a routine basis, at 8 to 10 weeks of age (the same age as for pullets destined for intensive production systems). The beaks of laying hens seen were short and stumpy (Figure 7). During a discussion with a representative of Qualite France, she pointed out that, although undesirable, debeaking is allowed to protect laying hens from cannibalism on the basis that it is carried out before conversion to organic status. Conversion to organic must commence by 12 weeks of age. However, the routine use of this painful practice as opposed to the gentler less painful method applied at under 10 days of age in the UK (and completely banned in Sweden) seems unacceptable. Beak trimming will presumably be ruled out at any age when there is a requirement to rear pullets in an organic system.

4.7 Feeding issues

4.7.1 Synthetic amino acids

Like Regulation (EC) 1804/99 and UKROFS Standards, the French Standards, while allowing the use of synthetic vitamins in feed, outlaw the use of synthetic amino acids.

This has made it difficult for nutritionists and feed formulators in all EU countries to include sufficient concentrations of methionine and lysine in poultry feeds so as to support optimum lean growth in table poultry, and optimum egg mass output in laying hens. Sufficient dietary methionine is also important to the efficient functioning of the immune system, and in minimising the risk of feather pecking and cannibalism. Feathers are rich in methionine and cystine, and feathers may be a source of these nutrients if feed is deficient.

The problem has recently been exacerbated in France by the current ban on the use of fish meal in animal feeds, implemented as part of the BSE control measures. However, the French industry has requested that fish meal guaranteed to come only from sea fish (i.e. no risk of contamination from animal products) should be allowed, and this is under consideration by the authorities. One certification body, Qualite France, has approved the inclusion of hydrolysed fish oil in organic poultry feeds, but this ingredient is too expensive to use in most poultry feeds.

In the UK, some organic poultry feeds are reported to include high concentrations of fish meal (over 10%), so as to achieve sufficient concentrations of essential amino acids in the feed. However, there is a risk of meat or egg taint. Indeed consumers have been complaining to supermarkets of fishy taints in their organic eggs during January of this year. There were similar complaints about organic eggs in France, but fish meal is no longer included in poultry feed. The 'fishy' taint problem in French eggs has been associated with the use of rape seed. Sinapine present in rape seed is metabolised to trimethylamine (TMA) by the bird, and when (TMA) is excreted in the egg this causes a 'fishy' taint. To avoid 'fishy' taint problems in eggs the inclusion of rape seed in laying hen feed is often limited to a maximum of 5% (Overfield and Elson, 1975).

French nutritionists have made several changes to feed formulations in an attempt to supply sufficient concentrations of essential amino acids. A variety of ingredients such as peas, lupins, sunflower, non-GMO soya beans, rape seed meal and brewers grains have been included in the feed so as to boost essential amino acid concentrations. The concentration of vegetable sources of protein in the diet is limited by the presence of antinutritive factors (reviewed by Gordon, 1999). A novel ingredient which is being tried is betaine. Betaine is a by-product of beet processing and it is said to be a substitute for methionine. However, betaine is metabolised to TMA by the bird and so high dietary concentrations may cause 'fishy' taint in poultry products.

Feed crude protein contents are often increased as a result of using an array of ingredients that are rich in one or more essential amino acid. One possible risk associated with increasing the crude protein content of the feed is that the litter condition will be poor. Birds will drink more water as it is needed in the deamination process, and droppings will be wetter. However, this has not been reported and at the time of the study tour it was too early to judge since fish meal was not removed from poultry feed until late 2000, and feeds including fishmeal may still have been in use. Methionine concentrations of organic feeds were established for two farms visited, the information is given in Table 3.

Table 3. Reported Methionine content of sample poultry feeds

Stock	Feed	Age (days)	Methionine content (%)
Table poultry	Starter	0-28	0.38
Table poultry	Grower	29-63	0.29
Table poultry	Finisher	64 - slaughter	0.28
Laying hens	Layers	126-504	0.25

The methionine concentrations in most of these organic poultry feeds are similar to those used in the UK when neither synthetic amino acids nor fish meal are included, and are lower than those generally found in conventional poultry feeds .The exception is the table poultry starter feed where it appears that hydrolysed fish oil was included. There were no obvious health or welfare problems on the farms visited. A further possible risk of using high crude protein concentrations in feed in order to achieve sufficient concentrations of essential amino acids is that the total nitrogen content of the manure may be increased. This is undesirable, especially in organic farming, and could lead to a reduction in the number of poultry that the land could support.

4.7 Manure use

The French Standards (Reference 7.1), in common with EU Directive 91/676/EEC and UKROFS Standards, require that the total quantity of manure spread on the holding does not exceed 170 kg of N per annum/ha of agricultural surface area. An additional provision in the French Standards (Reference 7.5) is "as the method for calculating nitrogen balances have not been definitively laid down the limit (170 kg N p.a./ha.)has been laid down provisionally and may be revisedas soon as these methods are validated by the CNLC (Commission Nationale des Labels et des Certifications de Produits Agricoles et Alimentaires).

The French Standards are more stringent than EU Directive 91/676/EEC as the French Standards require that holdings engaged in organic farming may only establish co-operation with other holdings or enterprises which conform to the organic regulations with a view to applying manure to their land (Reference 7.4). The ceiling of 170 kg N p.a./ha. is calculated on the basis of all the land farmed organically within the co-operation on which manure is spread.

In practice, co-operating farms are within a radius of about 12 km. The co-operative agreement is formed with the approval of an organic certification body. Arable farmers take appropriate amounts of manure according to their cropping schedule, and they supply organically grown cereals to organic poultry producers, either direct, or more usually via dedicated feed mills. However, the supply of cereals to organic poultry producers is not a prerequisite of the agreement.

4.8 Homegrown feedstuffs

A separate rule in the French Standards (Reference 4.3), in accordance with recital 6 of Regulation (EC) 1804/99, covers the production of cereals on organic poultry farms. The French Standards is more stringent than Regulation (EC) 1804/99 and UKROFS Standards, as the French Standards requires 40% self production of cereals from 30 August 2000 (except for those units which were certified as organic before 24 August 1999 where requirement is delayed by derogation until 24 August 2005). However, by 24 August 2003 a minimum of 10% of the cereals used on French organic poultry farms must be home- produced, and by 30 August 2001, the additional 40% must be produced on contract by organic holdings within the region (taken as meaning within a radius of about 12 km).

Some aspects of these arrangements are still under negotiation and were being debated vigorously during the study tour. Note Reference 4.3.5 of the French Standards, "in the case of pigs and poultry, specific projectsmay be the subject of special adjustments after the opinion of the CNLC has been sought".

4.9 Marketing and economics

France has a long history of marketing and consuming traditional poultry products, especially chickens, capons, duck and goose products. Latterly, free range eggs have become popular. Traditional poultry products have been promoted under quality guarantee fermier (farmers) labels such as Label Rouge- 'quality on a plate', and they are in good demand. Information provided by producers visited indicated that 80% of chickens are sold through supermarkets. In 1999, 52% of them were sold whole, all with a dressed carcass weight of about 1.6 kg.

Of the 52%, Label Rouge accounted for 26%, organic represented 1%, Certife (conventional free range) 4%, and conventional broilers 21%. A very wide range of whole table poultry are offered in supermarkets (Figure 8). Approximately 33% of the chickens sold in supermarkets were cut-up birds, and of these 28% were conventional broilers, 3% were Certife and 2% were Label Rouge.

Both free range and organic free range egg production have increased considerably in France since the mid 1990s. In 1999 about 4% of the total eggs produced were standard free range and about 2.5% were organic. A significant proportion of the latter were exported, mainly to the UK. Organic eggs sold in French supermarkets are generally offered as "servez vous" i.e. pick and pack your own (Figure 9).

Certife, Label Rouge and Biologique (organic) products are all sold at a premium over standard products, but the extra premium for organic products is small relative to traditional products. The premium for organic poultry products does not reflect the extra costs associated with production, exacerbated by additional production costs due to the introduction of new regulations. French organic arable farmers will benefit from considerable government subsidies over the next few years, but there will be no aid for specialist organic poultry farmers. In theory, the cost of organic cereals should reduce, and so should the costs of organic feeds, but poultry producers are sceptical.

Feed accounts for about 70% of poultry production costs and organic feed is expensive. One company provided the following example for Isa Brown laying hens:-

Laying cages		110	g/b	ird d	lay	@ FRI	F 1200/	/tonne	e. Fee	ed c	ost/	/her	ı p.	a. = FRF 48.2 (= \pounds 4.82)
[=19.0p/doz]														
Organic F R	130"	"	"	@	"	2800	"	"	"	"	"	=	"	132.9 (=£13.30) [=53.9p/doz]

The latter was expected to rise imminantly by 400 FRF (14%) to 3200 FRF/tonne.

Additional costs of organic egg production over those of 1999/2000 have been estimated by one large eggproduction company as:directly attributable to new organic French Standards on 30 August 2000in 2004 due to organic pullet rearing requirements a further-20%in 2005 when additional derogations cease-30%total increase by end of 2005-87%

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The above are daunting rises in production costs over a short period and it is not surprising that expansion in organic poultry production has come to a halt. Except for that already planned, there is virtually no new investment in facilities and some existing organic poultry farms are planning to cease production either immediately or in 2005. This would stop the trend for an increase in organic poultry production of about 50% per annum, which has taken place for the last four years. The French Ministry of Agriculture and Fisheries who have been trying to encourage organic production are aware of this situation. They told us that they intend to review it in two years, and if necessary, either increase subsidies or negotiate to reduce the severity of the rules.

Meanwhile, it is interesting to review the spread of organic poultry production geographically throughout the various French regions. Figures 11 and 12 show the spread in 1999 for table poultry and laying hens, respectively. The figures reveal that by far the greatest concentration of organic poultry of both types is in the north west, namely Brittany and Loire, with Brittany having the highest concentration of laying hens and Loire having the highest concentration of table poultry.

4.10 Organic pullet rearing

The French Standards are already more stringent than Regulation (EC) 1804/99 and UKROFS Standards, requiring a ten week conversion period rather than six weeks. Conversion must start at no later than 12 weeks of age, and most producers start at about 10 weeks of age. Pullets are either transferred from the rearing site to the organic laying farm at that age, or if they are kept on a non-organic rearing farm they are fed organic feed from 10 weeks, housed as a group where all pullets must enter organic farming. In the latter case, pullets must be transferred to the organic laying farm by the age of 18 weeks. Either way, the cost of production is increased.

The derogation allowing pullet rearing on non-organic farms until the end of 2003 in France and all EU countries is on the basis that organically reared pullets are not currently available in sufficient quantities. The UK is now considering the problems of moving to organic pullet rearing, and in 2000 the Ministry of Agriculture Fisheries and Food (MAFF, England and Wales) funded a research project on "Technical difficulties associated with organic pullet rearing" (OF0192). The project identified several topics in which research is needed in order to overcome current technical difficulties. Enquiries in France to the Ministry of Agriculture and Fisheries, the certification bodies, breeders and egg producers revealed that little thought has yet been given to the matter there. The problems are likely to be similar to those already identified in the UK, but some French producers will be reluctant to move away from debeaking. As described above in the section on poultry management, debeaking in France is currently fairly severe and is carried out systematically at 8 to 10 weeks of age. This is currently allowed by the certification body, Qualite France, on the basis that the pullets are debeaked before conversion starts. However, French producers expect it to be a major problem when organically reared pullets are required. The same will apply to the gentler beak trimming as done in the UK at under 10 days of age, and for this reason a research study to look at more natural methods of beak blunting and shortening has been proposed to MAFF.

4.11 Research

A recent MAFF-funded review of European research on organic farming (OFO171) revealed that no organic poultry R&D projects were funded by official bodies in France. The study tour confirmed this, and it also gave some information on-going industry-funded organic poultry R&D, and possible future R&D.

An animal feed association (ITAB) has carried out some research on certain aspects of organic feeding of poultry. Their address is 149, rue de Bercy, 75 595 Paris Cedex 12 tel: 01 40 04 50 64. The contact there is Dr Moraut - Email address: helene.moraut@itab asso.fr

The official French agricultural research organisation INRA is expected to commence some organic poultry studies later this year. The contact is Ms Bertryl Sylvander. 8, ave rene Laennec 72 000 Le Mans. tel: 02 43 39 94 00.

Some work related to organic poultry is being conducted at the Station Experimental d'Aviculture, 22 440 Ploufragan, Near St Brieuc. Brittany. A current study is comparing the performance and welfare of beak trimmed and non-beak trimmed pullets in two egg production systems - laying cages meeting the requirements of Directive 99/74/EC from 1 January 1002, and the alternative tiered platform system.

4.12 General

One of the farm visits was made together with scientific poultry welfare experts from several different European countries including Denmark, France, Germany, the Netherlands and Sweden. They commented on several differences between the French application of organic regulations and the application of Regulation (EC) 1804/1999 in their own countries. The majority of comments were related to organic egg production. The Dutch and German view on house stocking density has already been mentioned above. The Danish and Swedish visitors were adamant that routine systematic beak trimming, as practised in France, is not allowed under Regulation (EC) 1804/99, or the organic regulations in their countries. Denmark has a high percentage of organic poultry (e.g. over 10% of the laying hens) and reference was made to research being carried out on organic poultry there.

5.0 IMPLICATIONS OF FINDINGS

5.1 Development of organic poultry production

The history of small mixed farms and traditional production methods in France, especially for table poultry, should make it easier for French farmers to convert to organic poultry production. However, the high quality farmer labels, such as Label Rouge, readily attract a premium over a standard poultry products, whereas, organic poultry products are not attracting sufficient premiums to cover increasing production costs. The implementation of the French organic Standards has virtually halted the previous trend towards increased organic poultry production.

5.2 Regulations

There are many differences between France and the UK in the detail of their regulations. In some aspects the French Standards are more stringent than UKROFS Standards; in others more liberal. On balance there appears to be no obvious competitive advantage to organic poultry producers in either country. One possible exception within the French Standards is the change in date before which poultry farms need to have been certified as organic, in order to qualify for a major derogation on flock size and stocking density i.e. from 24 August 1999, as required by Regulation (EC) 1804/99, to 30 August 2000. This change appears to breach Regulation (EC) 1804/99 Annex I, part B, 8.5.1, and it seriously disadvantages UK and other European producers, who may have invested in organic poultry enterprises certified between 24 August 1999 and 30 August 2000.

5.3 Breed choice and suitability

There is a wide choice of breeds available within France and producers do not have difficulties in obtaining birds that are suited for use in organic production systems.

The wing banding of table poultry to ensure traceability is commendable, and could be considered for application in the UK.

Surgical castration is illegal in the UK and its approval should be removed from the UKROFS Standards. In view of the welfare implications of surgical castration, which oppose organic principles, representations should be made to have surgical castration removed from Regulation (EC) 1804/99.

5.3 Housing design and stocking density

There are important differences in the understanding of permitted stocking density on a ground floor basis where tiered platform systems are used, as in Germany and the Netherlands. Interpretation could be simplified by using the similar terminology i.e. usable area, as used within EU Directive 99/74/EC on the welfare of laying hens. The German and Dutch interpretation of a maximum of 6 hens/m? of usable area would then be acceptable. It would be possible to use similar systems to those used in Germany and the Netherlands in the UK, as they have been used in the past for conventional egg production and their use extended to France if desired.

The French practice of confining free range organic hens in the house until 28 weeks of age, and stocking them at a high density outside, contravenes Regulation (EEC) 1274/91. The eggs from such systems should not be sold as free range eggs in France, and they should not be exported to the UK as organic free range eggs, as is current practise.

5.4 Poultry management

The debeaking of pullets at eight to ten weeks of age as practised systematically in France would be unacceptable in the UK. Beak trimming is a most undesirable mutilation which should be avoided unless essential to prevent greater worse welfare problems. If it is essential to beak trim, it should only be carried out at up to 10 days of age (FAWC 1997).

5.4 Feeding issues

Banning the use of synthetic amino acids has considerably complicated the formulation of poultry feeds in both France and the UK. It may prove to have an adverse effect on health and welfare of the birds. If this is the case, representations should be made to the EU Commission for the limited use of synthetic amino acids in organic poultry feed. However, French nutritionists seem to have shown considerable ingenuity in searching for alternative protein sources, and it may be that solutions will be found by using a variety of ingredients at limited levels, especially if 'acceptable' sources of fish meal are permittrd.

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6.0 CONCLUSIONS

There are a few important differences between the implementation of Regulation (EC) 1804/99 in France and the UK especially regarding laying hens. In general, the French organic Regulations are more stringent than UKROFS Standards, but in some important aspects the French are less demanding, and in some instances appear to breach Regulation (EC) 1804/99 or Directive 99/74/EC. Certain aspects of the application of the Regulations in France, which appear to be approved by their certification bodies, give France an unfair competitive advantage over the UK. On one or two specific counts French organic eggs should not be exported to the UK, or elsewhere in the EU.

7.0 POSSIBLE FUTURE WORK

The study tour has revealed a few important differences between the application of Regulation (EC) 1804/99 in France and the UK, which give France a competitive advantage. Similar differences may well also apply between the UK and other EU Member States. In view of this, study tours would be worthwhile in other Member States who regularly trade with the UK in organic eggs and/or table poultry; these would include Italy, Denmark and the Netherlands. Useful information could also be collected on the control of feather pecking and cannibalism in non-beak trimmed pullets in Denmark, and tiered platform egg production systems in the Netherlands and Germany.

There is a clear need for alternative more natural methods of controlling injurious aggressive pecking in organic laying hens, than beak amputation. One potential approach proposed by research workers at ADAS Gleadthorpe merits experimentation, and if successful, further development. This work is urgent in view of the proposed requirement for organic pullet rearing from 01/01/04.

Nutritional studies on natural sources of essential amino acids, particularly methionine and cystine, are needed if synthetic amino acids, widely used in all poultry feeds for many years, are to be successfully replaced.

8.0 IP/TECHNOLOGY TRANSFER

There are no intellectual property implications arising from this study.

A verbal presentation of the results was made to representatives of the MAFF Organic Farming Unit and the FRCA on 15 January 2001. An interim summary report covering the salient points was submitted to the MAFF Organic Farming Unit on 23 January 2001.

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REFERENCES

Agriculture Biologique. Produits Bio - mode d'emploi. Ministere de l'Agriculture et de la Peche. Paris

Comparaison des cahiers des charges Francais et European en production biologique. pp 12-13. Tendance des Marches. Le mensual de l'economie avicole. Institut Technique de l'Aviculture (ITAVI). Paris (English translation available)

Comparative tables of the EU regime and the Member State system. Member State: FRANCE

Council Directive 1999/74/EC laying down minimum standards for the protection of laying hens. Official Journal of the European Communities. L 203/53. 3/8/1999

Farm Animal Welfare Council (FAWC) Report on the Welfare of Laying Hens. MAFF, London, pp. 16-17

French MAP Organic Website. www.agriculture.gouv.fr Route: rechercher/alimentation/signes de qualite/agriculture biologique.

French Specifications for Organic Livestock. French Official Gazette. 26/12/1992.

French Specification for Organic Livestock. French Official Gazette. 30/8/2000.

Gordon, S.H. (1999). The use of home grown protein sources in organic poultry rations. ADAS report to MAFF (OF0163)

Guide de Lecture du "Cahier des Charges REPAB F". Ministere de l'Agriculture et de la Peche. 18/11/2000

Overfield, N.D. and Elson, H.A. (1975). Dietary Rapeseed Meal and the Incidence of Tainted Eggs. British Poultry Science 16:213-217

Parker, M. (2001). Eating out at Rookery Farm. Poultry World, February: 34-35

Regulation (EEC) No. 1274/91. Marketing Standards for Eggs. Official Journal of the European Communities No. L 121/11. 16/5/1991

Regulation (EEC) No. 2092/91. Organic production of agricultural products and indications referring thereto on agricultural products and foodstuffs to include livestock production. Official Journal of the European Communities No. L 198. 22/7/1991

Regulation (EC) No. 1804/99. supplementing Regulation No. 2092/91 (above). Official Journal of the European Communities. No L 222/1. 24/8/1999

Review of current European research on organic farming. ADAS organic website: www.adas.co.uk/organic

Standards for Livestock Production. Organic Farmers and Growers (certification code UK 2) Manual. 15/12/2000, Section 8:49-50

United Kingdom Register of Organic Food Standards (UKROFS). UKROFS Standards for Organic Livestock and Organic Livestock Products. MAFF. London. 22 August 2000

Welfare of Livestock (Prohibited Operations) Regulations. Statutory Instrument 1982 no. 1884. MAFF. London.

Workshop and desk exercise to appraise technical difficulties associated with organic pullet rearing. ADAS research report for MAFF. MAFF project code: OF0192.