

## ***The food performance calculator "PerfAlim"***



### **Why should we consider the food performance of farms?**

The 21<sup>st</sup> century agriculture faces multiple challenges and, and its future development must simultaneously integrate the adaptation to environmental issues (global warming, depletion of fossil fuels and loss of biodiversity) and the ability to meet the food demand of a growing World population.

It is now estimated that the population will grow by 50% between 2009 and 2050, reaching 9.1 billion people. At the same time, the available farm workforce is expected to decrease, with 70% of the World population living in urban areas in 2050 (up to 49% at present). The rising standard of living and the effects of dietary transition under way in emerging countries must also be taken into account. Highly populous countries, like China, are about to consume a much more rich and diverse food.

All these assessments challenge many experts on the issues of changing agricultural production. According to the FAO (<http://www.fao.org>), the food production will have to increase by 70% in 2050. About 3 billion tons of cereals and 463 million tons of meat will be required to satisfy the world demand by 2050, compared to the current consumption of 2 billion tons of cereals and 228 million tons of meat.

The FAO estimates that the global food production require raising by 70% between 2005 and 2050, to reach an annual capacity of 3 billion tonnes of cereals and 463 million tonnes of meat (versus respectively 2 billion and 228 million tonnes today). Moreover, the expansion of arable land is likely to be very limited (+ 5% expected between 2010 and 2050 according to the FAO), due to the numerous hurdles preventing the exploitation of potentially cultivable areas (mainly in Latin America and Africa). Reported to the surface of arable land is currently decreasing worldwide, a trend expected to continue over the forthcoming years.

Obviously, the food performance of agriculture is a major challenge. How to feed 9.1 billion people in 2050, with little expansion of arable lands and with a reduced environmental pressure? This challenge should warn us of the necessity to assess the "food impacts" of our activities when we

explore innovative solutions. Today, the general public is , more sensible to environmental issues and recent events, such as the 2008 food crisis, made him feel concerned by the increasing food demand.

The food performance calculator PerfAlim was developed by the CEREOPA in this very challenging context. It is nowadays proposed to farmers with three main objectives :

- **To Inform stakeholders about the food performance level of their farm**, that is to say the capacity to meet the nutritional needs of the population in Energy and Proteins, with representative and homogeneous data, based on simple and transparent hypotheses.
- **To assist stakeholders in the arbitration of strategic choices to lead their farm system,,** by integrating a food performance indicator into their general performance indicators panel.
- **Communicate to the general public** about the genuine function of agriculture, **feeding people**, which is sometimes masked by other issues.

Integration of the food performance in the monitoring indicators of a farm was initiated in the PerfAgro P3 model (<http://www.cereopa.com/fr/actions/perfagro.html>) developed in 2008 by the CEREOPA. This decision support tool aims at identifying the optimal solutions for the farms, in terms of economic margin, food and environmental performance, by exploring possible options for choice of production (nature of business and technical methods of production).

The 3 Ps of Performance indicators: a PerfAgro P3 approach:



**Profit** = economic margin of the farm, **Planet** = fossil energy consumption and GHG emissions; **Population** = food potential of the farm.

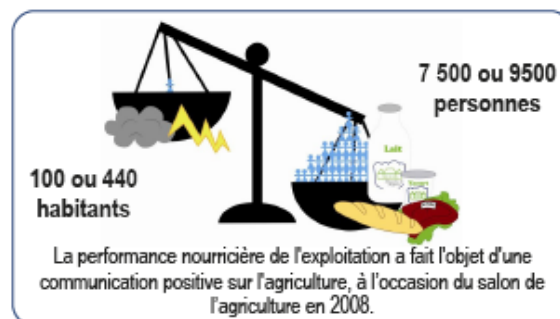
This triple approach of the performance of a farm is studied in the project **Grignon Positive Energy** (GE +). This project, initiated in 2005, and led at the AgroParisTech experimental farm of Grignon, deals with the important issue of possible and desirable adjustments of food sector (production and transformation) to meet the Energy crisis and the Global warming climate challenges, while maintaining a high productivity target. The **Grignon Positive Energy** project is structured in two main workpackages : a **technical** one, aiming at exploring innovative solutions to improve the environmental performance of farms, and an **educational** one, aiming at designing efficient tools to communicate and to educate the general public about the environmental and societal issues of agriculture.

The experimental farm of Grignon, in the Plaine de Versailles (50 km from Paris) :



The solutions implemented and assessed at the Grignon farm allow to minimize its environmental impacts while maintaining its ability to fulfill its primary function, feeding people. In figures, the farm consumes as much fossil energy as 75 French people, emits as much greenhouse gases as 320 French people, but it can feed between 5 500 and 8 800 people.

The performance balance of the Grignon farm: the environmental impacts are put into perspective of the food performance



The methodology used for the development of the food performance calculator PerfAlim, and the key elements to analyze and communicate the farm results are explained in the companion document **Methodological guide**.

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