



## Eat pork without concern. EU pork does not have exogenous Growth Hormone

<sup>1</sup>Florin L. Criste, <sup>2</sup>Ioan G. Oroian, <sup>1,2,3</sup>I. Valentin Petrescu-Mag

<sup>1</sup> University of Oradea, Oradea, Romania; <sup>2</sup> Faculty of Agriculture, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania;  
<sup>3</sup> SC Bioflux SRL, Cluj-Napoca, Romania.

Corresponding author: I. V. Petrescu-Mag, zoobiomag2004@yahoo.com

**Abstract.** For decades, factory farms routinely fed hormones to the pigs to achieve abnormally fast growth rates. These hormones involved both steroidal and peptidic hormones. One of the chemicals used in the past in animal farming is the Growth Hormone. In 1981, the European Union prohibited the use of substances having a hormonal action for growth promotion in farm animals. However, even today there are people who believe that with pork they also eat growth hormone. There should be no cause for concern: first, the growth hormone is not orally absorbed, and in the second place the growth hormone is no longer used in animal husbandry. In the recent period, pork production companies work on improving the alleles at the loci involved in pGH synthesis. Selective breeding, over many years, is actually the main cause of fast growth in meat animals, which definitely does not cause any human health concern.

**Key Words:** porcine Growth Hormone, pGH, pork production, EU, no hormone, no concern.

Factory farming is always in rush to raise livestock to slaughter weight as soon as possible. For decades, factory farms routinely fed hormones to the pigs to achieve abnormally fast growth rates. These hormones involved both steroidal and peptidic hormones. One of the chemicals used in the past in animal farming is the Growth Hormone (GH) or Somatotropin.

GH is a member of the somatotropin/prolactin family of hormones which play an important role in growth control. Porcine recombinant GH produced in *E.coli* is a single, non-glycosylated, polypeptide chain containing about 190 amino acids and having a molecular mass of around 21730 Da. This peptide is purified by various chromatographic techniques developed by the producers.

Studies on GH were initiated in the 1950s, the most important target being the Human Growth Hormone (HGH) (Hunter & Greenwood 1962; Greenwood et al 1963; Glick et al 1963). However, similar studies involved studies on GH in other human models like mouse for instance (Shull et al 1956).

Large numbers of studies published in the last century have demonstrated that treating pigs with exogenous pituitary porcine growth hormone (pGH) significantly increases pig growth performances (Boyd et al 1986; Campbell 1988; Chung et al 1985; Etherton et al 1986, 1987). In the same period, it has also been shown that recombinant pGH mimics the effects of pituitary growth hormone (Evock et al 1988). The various research found in literature were designed by various research teams. Therefore, the amplitude of response in those studies has varied somewhat primarily due to differences in experimental design (Etherton 1989). However, despite the differences, it has become apparent that pGH increases average daily gain with approximately 10-20%, improves feed efficiency with 15-35%, decreases fat deposition with 50-80% and simultaneously increases protein deposition by as much as 50% (Etherton 1989).

These responses and changes in pig development have attracted interest in developing a recombinant pGH-based growth promoter for the pork production world wide. It was expected that in addition to the economic benefits accomplished by the producer who integrates pGH into their production scheme, the other benefit of this new technology is providing leaner pork for the consumer. In fact, the greatest benefit of this technology to society was expected to be the ability to produce meat that is considerably leaner (Etherton 1989).

Shortly after, there was a flourishing period for the use of hormones (including GH) in meat production. One of the consequences was that meat as food gained a poor image. It was concerns about health risks that led to hormones being banned for use in meat production in Europe early in the 80s. In 1981, the European Union prohibited the use of substances having a hormonal action for growth promotion in farm animals (Directive 81/602/EEC). Only three uses remain permissible on a transitional basis and under strict veterinary control: treatment of fetus maceration/mummification, pyometra in cattle (for animal welfare reasons) and oestrus induction in cattle, sheep, goats, and horses (Directive 81/602/EEC).

Even today there are people who believe that with pork they also eat growth hormone. There should be no cause for concern: first, the growth hormone is not orally absorbed, and in the second place the growth hormone is no longer used in animal husbandry.

In the recent period, pork production companies work on improving the alleles at the loci involved in pGH synthesis. Selective breeding, over many years, is actually the main source of fast growing in farm animals, which definitely does not cause any human health concern.

## References

- Boyd R. D., Bauman D. E., Beermann D. H., De Neergaard A. F., Souza L., Butler W. R., 1986 Titration of the porcine growth hormone dose which maximizes growth performance and lean deposition in swine. *J Anim Sci* 63:218.
- Campbell R. G., Steele N. C., Caperna T. J., McMurtry J. P., Solomon M. B., Mitchell A. D., 1988 Interrelationships between energy intake and exogenous porcine growth hormone administration on the performance, body composition and protein and energy metabolism of growing pigs weighing 25 to 55 kilograms body weight. *J Anim Sci* 66:1643-1655.
- Chung C. S., Etherton T. D., Wiggins J. P., 1985 Stimulation of swine growth by porcine growth hormone. *J Anim Sci* 60:118-130.
- Council Directive 81/602/EEC of 31 July 1981 concerning the prohibition of certain substances having a hormonal action and of any substances having a thyrostatic action. *Official Journal L* 222, 07/08/1981. P.0032-0033.
- Etherton T. D., 1989 Mechanisms by which porcine growth hormone (pGH) and insulin-like growth factors (IGFs) regulate pig growth performance: approaches from the pGH and IGF receptors to the whole animal. In: *Biotechnology for Control of Growth and Product Quality in Swine. Implications and Acceptability*. Van der Wal P., Nieuwhof G. J., Politiek R. D. (eds), Pudoc, Wageningen, p.111-125.
- Etherton T. D., Wiggins J. P., Chung C. S., Evock C. M., Rebhun J. F., Walton P. E., 1986 Stimulation of pig growth performance by porcine growth hormone and growth hormone-releasing factor. *J Anim Sci* 63:1389-1399.
- Etherton T. D., Wiggins J. P., Evock C. M., Chung C. S., Rebhun J. F., Walton P. E., Steele N. C., 1987 Stimulation of pig growth performance by porcine growth hormone: Determination of dose-response relationship. *J Anim Sci* 64:433-443.
- Evock C. M., Etherton T. D., Chung C. S., Ivy R. E., 1988 Pituitary porcine growth hormone (pGH) and a recombinant pGH analog stimulate Pig growth performance in a similar manner. *J Anim Sci* 66:1928-1941.
- Glick S. M., Roth J., Yalow R. S., Berson S. A., 1963 Immunoassay of human growth hormone in plasma. *Nature* 199:784.

- Greenwood F. C., Hunter W. M., Glover J. S., 1963 The preparation of <sup>131</sup>I-labelled human growth hormone of high specific radioactivity. *Biochemical Journal* 89(1):114.
- Hunter W. M., Greenwood F., 1962 Preparation of iodine-131 labelled human growth hormone of high specific activity. *Nature* 194(4827):495-496.
- Shull K. H., Mayer J., Silides D. J., 1956 Analysis of the blood sugar response of obese-hyperglycemic mice and normal mice to hormones: growth hormone, cortisone, and corticotropin. *Endocrinology* 58(1):1-7.

Received: 02 June 2017. Accepted: 30 June 2017. Published online: 30 June 2017.

Authors:

Florin Leontin Criste, University of Oradea, Universităţii Street no. 1, Oradea 410087, Bihor, Romania, e-mail: florinleontincriste@gmail.com

Ioan Gheorghe Oroian, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Faculty of Agriculture, 3-5 Calea Mănăştur Street, Cluj-Napoca 400372, Romania, e-mail: camtod@yahoo.com

Ioan Valentin Petrescu-Mag, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Faculty of Agriculture, 3-5 Calea Mănăştur Street, Cluj-Napoca 400372, Romania, e-mail: zoobiomag2004@yahoo.com

This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

How to cite this article:

Criste F. L., Oroian I. G., Petrescu-Mag I. V., 2017 Eat pork without concern. EU pork does not have exogenous Growth Hormone. *Porc Res* 7(1):17-19.