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Nutritional manipulation of designer pork

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Designer foods

Designer foods are regular foods that contain nutrients that are good for your health. Because of their significance in preventive and health promotion, designer or functional foods are becoming more and more important.

Why designer Pork?

Composition of pork (per 100g)

- Water: 76 g
- Calories: 109 kcal
- Protein: 21 g
- Fat: 2.17 g
- Magnesium: 27 mg
- Phosphorus: 247 mg
- Potassium: 399 mg
- Iron: 0.98 mg
- Selenium: 30.8 µg
- Thiamine: 0.998 mg
- Vitamin B12: 0.51 µg

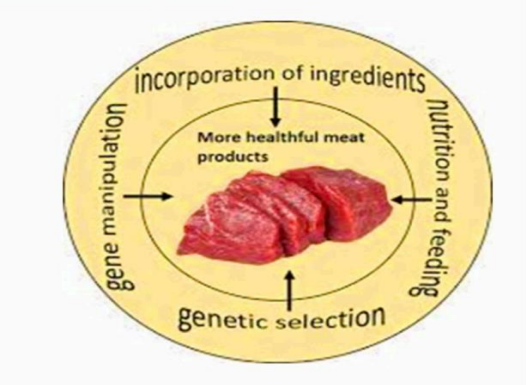
Pork's intramuscular fat contains fewer unsaturated fatty acids than those of beef and chicken.

Numerous illnesses, particularly cardiovascular disorders, may be brought on by an imbalance between the n-6 and n-3 groups of polyunsaturated fatty acids and a high intake of saturated fatty acids in the diet.

Concern over coronary heart disease and artherosclerosis linked to meat intake is on the rise.

Designing nutritional profile of pork through dietary approaches

- Is relatively simple economical.
- Reformulation of feed of swine.
- Supplementation of specific nutrients.



Lean pork production

The gain of the valuable sections of the pig's body is known as lean growth or lean meat deposition.

It is around four times more energetically efficient to create one kilogram of lean meat than one kilogram of fat tissue because of the high-water content and low-fat content.

supplying high-fibre, low-energy diets with a modified lysine-to-calorie ratio and eliminating any technology that promotes growth.

n-3 polyunsaturated fatty acids supplementation.

The health value of pork's fatty acid profile is improved when pigs are fed n-3 polyunsaturated fatty acid sources, primarily from marine origin

Usage of betaine in the different swine categories:

Piglets	– Replacement of choline chloride in the feed – Improve performance – Protect gut and improve gut morphology – Supply methyl groups (e.g. for creatine synthesis)
Grower/Finisher pigs:	– Replacement of choline chloride in the feed – Improve performance (weight gain, feed efficiency) – Improve carcass characteristics (less back fat, lower carcass fat and higher dressing %) – Heat stress protection
Sows	– Heat stress protection – Reproductive performance (reduced WEI, more total piglets born, lower body condition loss)
Boars	– Heat stress protection – Reproductive performance

(rich in eicosapentaenoic and docosahexaenoic acids).

Problem?

Soft fat develops as the polyunsaturate of swine fat increases.

Soft fat results in issues with handling and fabricating carcasses, lower bacon yields, greasy, nearly opaque-looking, unappealing goods, shorter shelf lives, and—above all—discrimination from both domestic and foreign customers.

Conjugated linoleic acid (CLA) supplementation

CLA is a natural anti-cancer and anti-heart disease substance found in ruminant foods and dairy products.

CLA-enriched pork by giving it 0.6% CLA for four to eight weeks before it is killed.

Backfat reduction, feed conversion, carcass leanness, loin marbling, and carcass fat stiffness have all been observed to be enhanced by CLA administration.

CLA may increase the overall value of extremely lean carcasses and offer a nutritional tool to combat issues with abdominal firmness and carcass fat caused by dietary unsaturated fats.

Antioxidant supplementation

Both farmers and customers value improving pork quality metrics and extending the shelf life.

One of the spoiling processes influencing the quality of pork is lipid oxidation. Pigs' adipose tissue has a high concentration of PUFA due to the PUFA in their diet, which can also oxidize.

Antioxidants

- Beta-carotene
- Lutein
- Lycopene
- Selenium
- Vitamin A
- Vitamin C
- Vitamin E

Pigs fed an extra 100–200 mg/kg of dl-a-tocopherol acetate successfully postpone the onset of lipid oxidation in ground pork, fresh whole-muscle pork slices, and precooked and cured pork products.

Betaine supplementation

- Lipotropic effect of betaine
- Betaine can decrease back fat and increase carcass leanness

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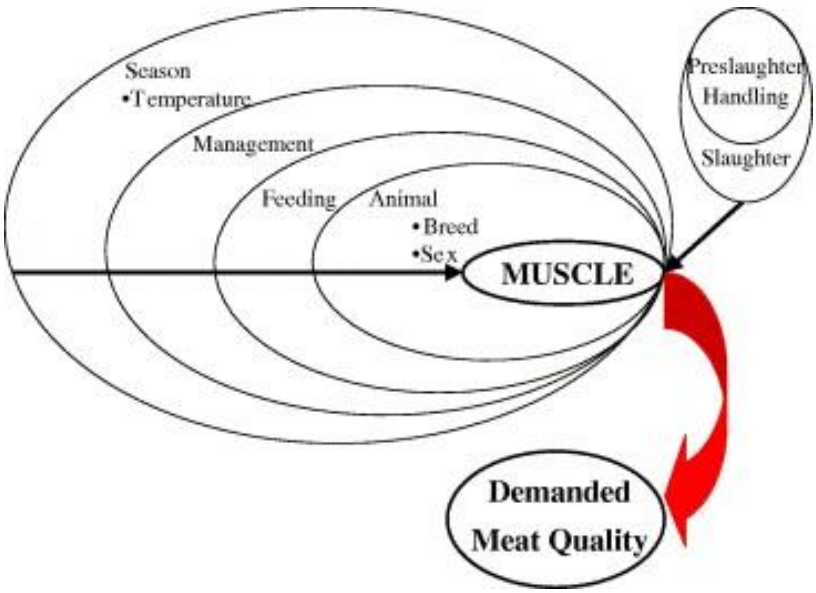

Arginine Supplementation

In growing-finishing pigs, arginine efficiently encourages muscle growth and decreases body fat accumulation.

Pigs treated with arginine showed a 5.2% increase in total skeletal muscles and an 11.2% decrease in total fat content.

M. longissimus dorsi's intramuscular lipid content rose to roughly 3 g/100g, which is thought to be optimal for the flavor, tenderness, and juiciness of pork.