

Is meat from stressed animals unhealthy?

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We love steak and sausages, but does a high level of anxiety in animals make them unhealthy to eat?

You've got your home polished and decorated but you still need to dash around to make the last preparations for a festive dinner.

But people are not the only creatures who experience stress. The animals that are destined to be meat on our dinner tables could have had a very tense trip to the slaughterhouse.

Research shows that stress among livestock affects the quality of meat as regards tenderness, perishability and colour.

More important is what they eat

Eli Gjerlaug-Enger is an animal husbandry researcher at the cooperative for Norwegian pork producers, *Norsvin*, and says one of the aims of her trade is the elimination of tension.

"The animals that yield prime meat quality are the ones that have not been subjected to stress," she says.

However, Gjerlaug-Enger doesn't think stress affects the healthiness of meat.

"Stress alters protein composition, vitamin content and minerals. But in all the research material I've come across, I've seen no connection between stress levels and less healthy meat," she says.

As regards to healthiness of the meat it's more important to focus on what the animal eats.

Sections of Norwegian regulations are aimed at mitigating livestock stress.

"Along with Sweden and Switzerland we have the world's most stringent regulations for raising pigs," says Gjelaug-Enger.

She adds that pigs are given things to play with in their pens because they become stressed by inactivity.

Eight hour drive to the slaughterhouse

Lots of factors can have stressed your ham when it was still up and oinking. Researchers we've contacted mention several:

Inactivity, noises, new boars in the pen and long transport distances to the slaughterhouse can be stressful for the animals.

Norwegian regulations limit the duration of this transportation to a maximum of eight hours. Yet in special circumstances this can be extended to 11 hours.

Everyone interviewed for this article agrees that nobody gains from stressed animals, because it's

detrimental to animal welfare and meat quality.

But they disagree as to whether enough is done to provide livestock with an laid-back daily life.

Cheaper food is not favourable for the animals

Ann-Margaret Grøndahl is a researcher at the Norwegian Veterinary Institute.

She isn't convinced that the law sufficiently protects livestock against stress.

She says the regulations about providing activities for the animals may look great on paper but the salient point is what is actually done, and that can vary widely.

A project conducted by the Norwegian Veterinary Institute investigates how distance from the farm to the slaughterhouse affects animal welfare and meat quality.

The geographical structure of slaughterhouses has changed in Norway in past decades. Several smaller, local slaughterhouses have closed down and just a few, larger ones have survived.

“This means that many animals are subjected to long hauls, and in many rural areas these rides are on narrow, curvy, bumpy roads, which are stressful for the livestock,” Grøndahl explains.

“Consumers demand increasingly cheaper food, so efforts are made to cut costs in every step of livestock production. Unfortunately this is unfavourable for the animals,” concludes Grøndahl.

Lack of research on stress

Little research has been conducted to date regarding how livestock stress influences the health-giving qualities of meat.

Many assume that this lack of research relates to the fact that there are no indications that the meat is unhealthy for us to eat.

“As long as the stress factors are limited to transport and butchering, there are no reasons to think this affects nutrition,” says Laila Aass.

Aass is a researcher at the Department of Animal and Aquaculture Sciences at the Norwegian University of Life Sciences at Ås (UMB).

Her work is mainly with the link between genetics and beef product quality but she also investigates environmental factors such as stress.

“If an animal is mistreated, causing for example infections, it's reasonable that this can affect nutritional content,” she says.

She emphasizes that animals with infections are culled by the food manufacturing controllers at the slaughterhouse and these are destroyed and never used for food.

Dark, firm and dry meat

Laila Aass explains that stressed cattle yield DFD-meat, an abbreviation for Dark, Firm and Dry.

“It affects perishability,” says Aass.

DFD is caused by the muscles of the animals being depleted of their stored muscle energy prior to

slaughtering, which hinders a natural decrease in pH level after the animal dies.

Aass says it's easy to see this in meat, and it is sorted out at the slaughterhouse.

This doesn't necessarily mean it isn't used.

Aass explains that DFD-meat cannot be utilised for beef destined for ageing, but it can be used for products that are salted, smoked or heat-treated, such as smoked sausages.

Genetic flaw eliminated

Stressed pigs yield the opposite effect as cattle. Pork becomes PSE-meat (Pale, Soft and Exudative).

According to researchers at *Norsvin*, PSE-meat stems from a genetic flaw that makes the pigs unable to tackle the stress of being transported to the slaughterhouse.

Researchers say this can be eliminated through selective breeding and the problem is no longer found among Norwegian pigs.

But stressed cattle can more readily develop DFD-meat, because they have less stored energy, or glycogen, in their muscle tissue.

But even pigs can develop DFD, if they are starved and subjected to long-term stress, according to Eli Gjerlaug-Enger at *Norsvin*.

Little long-term stress

The lives of livestock are often so short that long-term stress lacks time to develop, but a few pigs live quite a long time before they are butchered.

According to the statistics on the website animalia.no about 1.5 million pigs are slaughtered in Norway annually.

And 95 percent of the pork that ends up on Norwegian tables comes from pigs that have been slaughtered at the age of five months.

Sows represent four percent, which means that around 70,000 of them are butchered in Norway every year.

There are no statistics regarding how old sows are when they are slaughtered but on the average they have three farrows. That puts them at the age of 1.5 to three years.

In a few cases they are slaughtered even later in life.

Sows become sausage

Tor Olav Brandtzæg is an information officer at *Nortura*, a merger between two large Norwegian meat and poultry producers Gilde and Prior.

He says that pork from sows is often used in processed meat products and sausages.

“This depends on the size and coarseness of the meat. The best filets come from pigs that are younger than sows.”

But Brandtzæg doesn't think the length of life has any impact on the healthiness of the meat.

“The influence of stress on meat is most often caused by sudden incidents, such as transport or arriving at a slaughterhouse.

The stressing of animals harms their welfare and the quality of their meat, so we have routines that make for as little stress as possible,” he says.

Brandtzæg says that very few transports are as long as the eight hour limit, but even short trips can be unfavourable.

“For example pigs get stressed by loading and unloading, so short trips can mean more anxiety for them because they don’t get enough time to settle down on the vehicle,” says Brandtzæg.

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Glenn Ostling

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