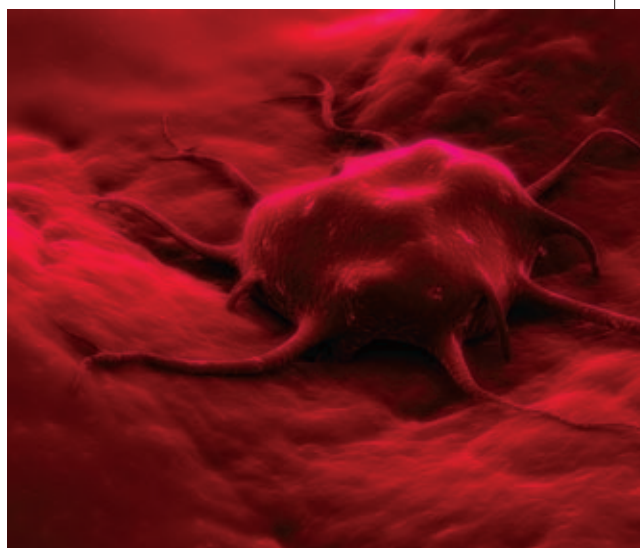


SECTION 6 GYNECOLOGIC CANCERS

A summary of epidemiologic studies of red meat or processed meat intake and ovarian cancer, endometrial cancer, and cervical and vaginal cancers.



Cancer cell

OVARIAN CANCER

The ovaries are female reproductive organs that store and release the egg that is needed for conception. Ovaries also regulate the menstruation cycle through the production of estrogen and progesterone. Ovarian cancer has the highest fatality-to-case ratio of any gynecological malignancy.

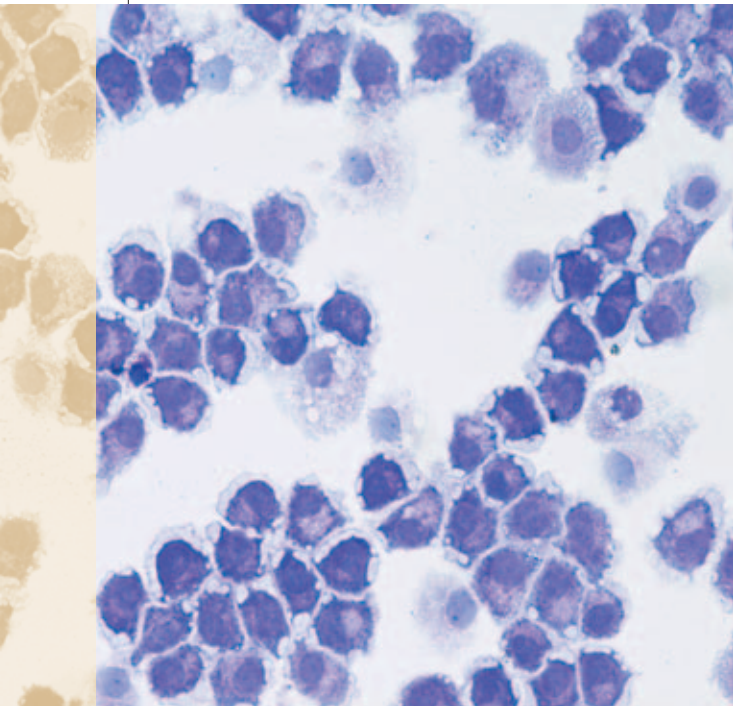
Since this malignancy has nonspecific symptoms, the majority of women are diagnosed when the disease has already become metastatic, resulting in a poor prognosis. The consequence of a late diagnosis enhances the need for prevention; however, the causes of ovarian cancer are largely unknown. It has been suggested that meat consumption increases the risk of ovarian cancer as a result of exposure to endogenous hormones (Thomas et al. 1999), but there is limited epidemiological evidence related to diet due to the low incidence of this disease. In fact, in the WCRF/AICR report on diet and cancer, it was concluded that there is limited information to confirm an association between any dietary factors and ovarian cancer (WCRF/AICR 2007).

Since ovarian cancer has nonspecific symptoms, the majority of women are diagnosed when the disease has already become metastatic, resulting in a poor prognosis.

To date, there are approximately eight cohort studies that evaluated the association between meat consumption and ovarian cancer. Of these, three studies specifically reported results for red meat, three studies included both red and processed meats, one study focused solely on fried meat, and one study did not specify the type of meat that was included in their analysis. All of these studies showed a slight increase in risk of ovarian cancer; however, with the exception of fried meats, the results were not statistically significant (Schulz et al. 2007).

On the contrary, significant associations between red meat consumption and ovarian cancer have been found in some case-control studies. In general, most case-control studies that evaluated red or processed meat consumption and ovarian cancer outcomes, reported associations ranging from 1.2 to 1.6 for red meat and 1.0 to 1.2 for processed meats.

Collectively, the available epidemiologic evidence surrounding red meat and processed meat consumption does not appear to support an independent association with ovarian cancer. This conclusion is based largely on findings from prospective cohort studies for which non-significant associations were observed.



Human blood cells

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ENDOMETRIAL CANCER

The endometrium is the lining on the inside of the uterus. During pregnancy, the endometrium forms the placenta that nourishes the fetus. When a woman is not pregnant, the endometrium sheds during menstruation. Endometrial cancer is the most common gynecological malignancy in the United States (Bandera et al. 2007). There is substantial evidence to suggest a strong association between hormone levels and the risk of endometrial cancer. Therefore, factors that increase circulating hormone levels, such as obesity and exposure to unopposed estrogens, are known to be associated with endometrial cancer (Ganmaa et al. 2005).

It has been postulated that a diet high in meat may increase the risk of endometrial cancer; however, few nutritional epidemiologic studies have evaluated endometrial cancer as an endpoint (Bandera et al. 2007). In their 2007 report, the WCRF/AICR concluded there was limited evidence to suggest that red or processed meat consumption causes endometrial cancer. Only three cohort studies have evaluated the association between red meat intake and endometrial cancer, with no evidence of increased risk. In the NIH-AARP cohort study, Cross et al. (2007) reported a statistically significant inverse trend across all red meat consumption groups, with the strongest protective effect observed in the highest quintile of consumption (RR = 0.75, 95% CI: 0.62-0.91). In the Canadian National Breast Screening Study, which includes more than 31,000 women aged 40-59 years, a non-significant 14% decrease in risk among women in the highest meat consumption category was reported (Kabat et al. 2008). In the Women's Health Study, which included 23,000 postmenopausal women,

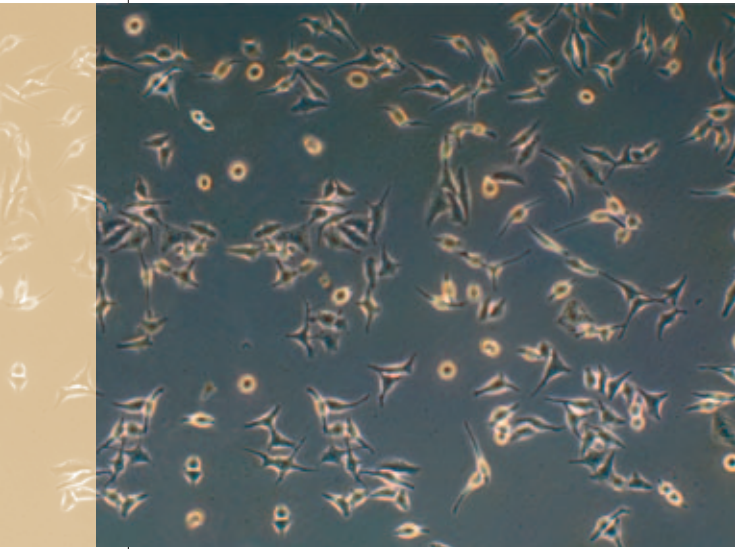
a non-significant 10% increase in risk of endometrial cancer among women in the highest tertile of red meat consumption was observed (Zheng et al. 1995).

Several case-control studies have evaluated red meat and endometrial cancer, and results from these studies have been summarized in a meta-analysis (Bandera et al. 2007). The results of the meta-analysis, based on data from seven studies, indicated a significant 51% increased risk of endometrial cancer per 100g/day of red meat consumption (Meta OR = 1.51, 95% CI: 1.19-1.93).

Data on processed meat and endometrial cancer are limited. Two cohort studies have evaluated the association between processed meat consumption and endometrial cancer. Cross et al. (2007) found no association between consumption of processed meat and risk of endometrial cancer. In the Canadian National Breast Screening Study, processed meat was analyzed together with fish intake, and a significant 50% increased risk was observed among women in the highest tertile of consumption compared with women in the lowest tertile of consumption (Zheng et al. 1995). Only three case-control studies have evaluated processed meat intake and endometrial cancer risk, with inconsistent results.

Although some case-control studies have indicated positive associations between red meat consumption and endometrial cancer, data from prospective cohort studies have been conflicting. Additional large-scale cohort studies are required to clarify any potential associations between meat consumption and endometrial cancer. As it stands, the available epidemiologic evidence does not support an independent association between red meat or processed meat intake and endometrial carcinogenesis.

Endometrial cancer is the most common gynecological malignancy in the United States, and there is substantial evidence to suggest a strong association between hormone levels and the risk of endometrial cancer.



Cervical cancer cells

CERVICAL AND VAGINAL CANCER

Cancers arising in the cervix and vagina are known to be strongly associated with human papillomavirus (HPV) and exposure to diethylstilbestrol (DES), respectively. As a result, nutritional epidemiology studies of these cancer outcomes are conducted infrequently. In the aforementioned cohort study by Cross et al. (2007), no association was found for red meat intake and cervical cancer, although a non-significant 72% increased risk was observed among the highest consumers of processed meat and there was a statistically significant trend across exposure categories. Interpretation of the potential association between red meat or processed meat intake and cervical or vaginal cancer is limited by sparse data. The available epidemiologic evidence does not indicate a statistically significant positive effect.