

# Journal of Biological Research

Bollettino della Società Italiana di Biologia Sperimentale



**95<sup>th</sup> National Congress of the  
Italian Society for Experimental Biology**

**Trieste, Italy, 12-15 April 2023**

ABSTRACT BOOK

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Bollettino della Società Italiana di Biologia Sperimentale

eISSN 2284-0230

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# 95<sup>rd</sup> National Congress of the Italian Society for Experimental Biology

**Trieste, Italy, 12-15 April 2023**

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or tris(2,4-di-tert-butylphenyl)phosphite, an antioxidant IAS commonly used to improve the stability of polyolefins (POs) and approved for food contact. During processing, IRGAFOS 168 can degrade by oxidation and hydrolysis forming two NIAS: tris (2,4-ditertbutylphenyl) phosphate (I168-Ox) and 2,4-di-tert-butylphenol (2,4 DTB) respectively; the extrusion conditions can affect the extent of IRGAFOS degradation and subsequent NIAS formation. By gas chromatography/mass spectrometry analysis we found that F48 contained 2,4 DTB and 168-ox at the concentration of 220 µg/g and 66 µg/g, while F56 showed a higher content of 2,4 DTB and I168-ox (342 µg/g and 150 µg/g respectively). To study *in vitro* cytotoxicity, hPBMCs from five unrelated human healthy donors were stimulated or not with phytohemagglutinin (PHA) and seeded in 96-well plates containing increasing concentrations (from 37 mg/ml to 296 mg/ml) of conditioned culture media previously exposed to F48 and F56 for 48 hours or 18 days to mimic a condition of NIAS production and release from POs. Cells were treated with these conditioned media and then MTT assay was used to evaluate the cytotoxic activity after 24 and 48 hours. Results showed that the treatment did not affect cell viability in both stimulated and unstimulated hPBMCs. However, an increase of cell viability at lower doses tested was observed at both 24 and 48 hours of treatment. In order to verify if this increase could be due to a general metabolic activation or was the consequence of the induction of a proliferative activity, a BrdU-based proliferation assay was carried out on PHA stimulated hPBMCs treated as in the MTT assay. Results have shown a marked (about 30 %) increase of cell proliferation compared to controls at lower concentrations. In summary, these preliminary results show that NIAS produced during F48 and F56 manufacturing do not induce any cytotoxic effects in differentiated human lymphocytes while improving cell metabolism. However, tested NIAS may alter the normal control of proliferation in lymphocyte precursors that are physiologically present in lymphoid organs. This might suggest that a chronic exposure to these substances, alone or in combination with other environmental pollutants could interfere with normal activity of human lymphocytes potentially representing a human health risk.

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#### BROILER CHICKENS AND THEIR HEALTH STATUS IN FARM: WINE WASTE, AN ADDED VALUE ON FEEDING

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Various key economic sectors of the National and Sicilian economy, in addition to contributing to the economic growth also cause a considerable production of waste which today are a problem both for companies then for the environment. For this reason, there is considerable interest in this waste and in the possibility of their reuse to extract bioactive molecules with added value, all in accordance with the objectives of the Blue Economy. In this regard, it has already been demonstrated that from the production waste of various economic sectors it is pos-

sible to obtain bioactive molecules with anticancer, antimicrobial, cosmetic, antioxidant and nutraceutical properties (Mauro *et al.*, 2022). If we focus on farm animals and the feed used, it is known that the latter can be a source of antioxidants which help the body to prevent the harmful effects of free radicals and metabolic products. In this context, polyphenolic compounds (*e.g.* flavonoids) showed important antioxidant activities *in vitro*, although it seems that these are poorly absorbed in the intestine and their tissue concentrations are too low to contribute to the antioxidant defense (Surai, 2013). In light of all this, within the SMILING Project a study concerned the possibility of reusing wine production waste (pomace and grape seeds, the cause of the production of considerable quantities of waste) rich in fatty acids, triglycerides and polyphenols (Di Stefano *et al.*, 2021; 2022) in the feeding of broiler chickens by evaluating the possible effects of these diets on the animal's health status also in terms of antioxidant capacity. Three experimental sets were carried out and concerned the administration of three different types of diets: Grape marc (0%, 3% and 6%), Grape seeds (0%, 3% and 6%) and a mix of grape marc and grape seed (0 and 3%). At the end of the experimental times, biomarkers typical of the evaluation of the state of health of the organisms were used for the preliminary analyzes of the blood and meat samples. Significant effects were observed in all diets depending on the concentration administered. Probably the phenolic content of the flours used contributes to the improvement of the health of the farmed animals.

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#### ANTITUMORAL ACTIVITY OF *Asparagus officinalis* EXTRACTS AGAINST BREAST CANCER

Arianna ROMANI<sup>1,4</sup>, Fabio CASCIANO<sup>2,4</sup>, Giada LODI<sup>1</sup>, Nicola MARCHETTI<sup>3,5</sup>, Rebecca VOLTAN<sup>1,4</sup>

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Breast cancer (BC) is the most frequent cancer among women and high rate of resistance and loss of response to treatment enhance the attention in novel drug research, mainly from natural origins. *Asparagus officinalis* (Asp) is reported to possess therapeutic properties, both from edible and inedible portions. We characterized the chemical content of new aqueous extracts