similar al del aceite de chía sin encapsular (1,87 mmol peroxido/kg aceite).

32. **Glycerol transformation by oxidation in a basic homogeneous medium using a gold catalyst.** Jorge M. Marchetti[1] and Alfredo Juan[2], [1]Norwegian University of Life Sciences, Ås 1432, Norway; [2]Universidad Nacional del Sur, Av Alem 1253, Bahia Blanca 8000, Argentina

The use of gold catalyst in alcohol oxidation reactions is becoming increasingly important compared to conventional catalyst, such as Pt, Pd, due to its good performance.

The amount of biodiesel produced in the world is increasing. Therefore, the amount of glycerol is increasing as well, making it a cheap new raw material. Its purification can be a solution; however, the pharmaceutical industry cannot process all the available glycerol. In consequence, different alternatives use needs to be found. Transformation of glycerol into 1,2 and 1,3 propanediol is a suitable alternative. In this work, oxidation of glycerol using gold catalyst in a methanol medium using atmospheric air as oxidant has been studied. This oxidation produces, primarily methyl glycerate, with a higher level of oxidation on the molecule of glycerol, dimethyl tartronate can be obtained and finally dimethyl mexosalate can be produced.

Different reaction temperatures, air pressure, amount of catalyst, base content, reaction time, reuse of catalyst have been studied and its effect have been analyzed and compared in order to have a better understanding of the catalyst and the reaction itself.

Good final conversion (over 75%), selectivity toward the desirable product s and yield were obtained when 10% (w/w) amount of catalyst is employed in the reaction.

33. **Quality, Composition and Oxidative Stability of Avocado Oil.** Andrea M.M. Guedes[1], Tissiane A. de Oliveira[1], Flavia M.S. Licurgo[1], Allan E. Wilhelm[2], Adelia F. de Faria-Machado[2], Rosemar Antoniassi[2], [1]CNPq, Av. das Américas, 29501 – Guaratiba, Rio de Janeiro 23020-470, Brazil; [2]EMBRAPA, Av. das Américas, 29501 – Guaratiba, Rio de Janeiro 23020-470, Brazil

Brazil produces around 150,000 tons of avocado, mainly of Hass, Margarida and Fortuna varieties. There is a great demand for avocado oil due to its fatty acid composition, phenolic compounds and vitamin E content. In this work, avocado oil (Hass variety) was produced in an expeller press of 5 kg/h from lyophilized pulp and compared to the oil obtained from pressing (40 kg/h) using pulp subjected to drying in a tray drier. These oils were compared to samples of commercial oils produced in Israel and Chile. The oils were analyzed for the quality, composition and oxidative stability according to the AOCS official methods. There were significant differences among the evaluated samples regarding the fatty acid composition, acidity, peroxide value, oxidative stability index (Rancimat) and chlorophyll content ($p<0.05$). As expected, oxidative stability was lower for the samples of higher peroxide value and chlorophyll content.

34. **Effect of different screw press feed rates on extraction efficiency, quality parameters and fatty acid composition of passion fruit seed oil.** Allan E. Wilhelm[1], Sandro L.R. Reis[2], Gabriela R. Back[1], Andrea M.M. Guedes[1], Adelia F. Faria-Machado[1], and Rosemar Antoniassi[1], [1]EMBRAPA, Av das Américas 29501, Rio de Janeiro 23020470, Brazil; [2]Extrair - Óleos Naturais, Rodovia RJ 230 – KM 06 - Quadra 03, Lotes 03 e 04, Bom Jesus do Itabapoana 28360000, Brazil; [3]Universidade Estadual do Norte Fluminense Darcy Ribeiro, Av Alberto Lamego 2000, Campos dos Goytacazes 28013602, Brazil

Passion fruit is appreciated worldwide and Brazil stands as its major producer. The industrial processing of passion fruit juice produces significant quantities of waste that is regularly disposed in the environment. About 15-25% of this waste is composed of seeds, which have an oil content up to 30%. This oil is rich in unsaturated fatty acids and is a valuable product for food and cosmetic industries. The aim of this study was to evaluate the effect of different press feed rates (1.2; 1.8; 2.4 kg/h at 18 rpm and 3.0 kg/h at 24 rpm), using a 5 kg/h screw press, on the extraction efficiency, quality parameters and fatty acid composition of the oil. Concerning the extraction parameters, it was observed a trend of better results at 2.4 kg/h feed rate, especially due to the lowest outlet temperature of the oil (78°C), while other press conditions showed values up to 89°C. Extraction efficiency and residual oil content ranged from 86.1-87.3% and 5.2-5.6%, respectively. Regarding the oil quality and composition, no significant differences ($p>0.05$) were observed for fatty acid composition, acidity, oil moisture, relative density, oxidative stability, conjugated dienes and refractive index, iodine and saponification value among the evaluated press feed rates. However, at 3 kg/h the lowest free fatty acids content (1.3%) was obtained and at 1.2 kg/h the highest oil moisture (0.3%) was observed. Screw pressing is a feasible method to obtain passion fruit seed oil with both, high extraction efficiency and good oil quality.

35. **Differences in passion fruit seed oil quality according to fruit processing.** Allan E. Wilhelm[1], Sandro L.R. Reis[2], Suelen A. Regis[3], Sergio A. Cenci[1], Andrea M.M. Guedes[1], Adelia F. Faria-Machado[1], Rosemar Antoniassi[1], [1]EMBRAPA, Av das Américas 29501, Rio de Janeiro 23020470, Brazil; [2]Extrair - Óleos Naturais, Rodovia RJ 230 – KM 06 - Quadra 03, Lotes 03 e 04, Bom Jesus do Itabapoana 28360000, Brazil; [3]Universidade Estadual do Norte Fluminense Darcy Ribeiro, Av Alberto Lamego 2000, Campos dos Goytacazes 28013602, Brazil

Brazil is the largest passion fruit producer and the industries of fruit juice and pulp are responsible of processing 40% of this total. The passion fruit seed is a waste in this industry and it is discharged or used in animal feed. The dried seeds are equivalent to 4% of the fresh fruit weight and contain a valuable oil for cosmetic purposes, which can be extracted by pressing, since the oil content, in dried seeds, varies from 18 to 35%. In order to process the passion fruit seeds, for oil production, the first step consists in washing

them to separate the arils, followed by drying, pressing and filtering. The aim of this work was to process passion fruit seeds to recover the oil from different industrial passion fruit pulp manufacturers. The seeds were washed with water, dried and expeller pressed in an equipment of 100 kg/h. The oil composition and quality analysis were carried out according to AOCS (2009). The oil yield was above 80% and the meal residual oil content was less than 7%. There were significant differences among oils obtained ($p<0.05$) for oxidative stability (Rancimat) and free fatty acids content. The acidity varied from 1.1 to 13.6% and it was attributed to seed moisture before processing and the broken seeds due to the pulp separation process. It was possible to obtain passion fruit seed oil of good quality depending on both, pulp and seed processing conditions.

36. **Caracterización de la viabilidad de semillas de inchi (Caryodendron orinocense Karsten) de dos procedencias.** Judith García and Carmen Basso, Universidad Central de Venezuela, Venezuela Maracay, 2101, Venezuela

Para caracterizar la viabilidad de semillas de inchi (Caryodendron orinocense Karsten) se utilizaron frutos recolectados en 2008, en Aragua, Venezuela. Se secaron durante cuatro días en bandejas y diariamente se colocaron muestras en envases con arena húmeda para determinar su emergencia. Hubo cinco tratamientos considerando días transcurridos desde la extracción de las semillas (dde), el diseño fue en bloques al azar (DBA) con dos repeticiones de diez semillas. A 28 días de la siembra (dds), el porcentaje de emergencia fue 75% y a los 32 dds el porcentaje de plántulas normales fue 65% para semillas recién extraídas (0dde). En ambos casos no hubo diferencias estadísticas, usando Friedman, entre 0dde, 1dde y 2dde pero si con 3dde y 4dde con menores porcentajes. Para evaluar las condiciones adecuadas de almacenamiento se utilizaron semillas recolectadas en 2009, en Barinas, Venezuela. Se planteó un diseño factorial 3x6 en DBA con tres repeticiones. Los factores fueron temperatura (3ºC, 12-13 ºC y 26-28ºC) y días de almacenamiento (2, 4, 6, 8, 10 y 12). El peso y el contenido de humedad de las semillas aumentan con el tiempo de almacenamiento. Luego del cuarto día de almacenamiento disminuye el porcentaje de germinación. El inchi posee semillas recalcitrantes que solo toleran hasta ocho días de almacenamiento, preferiblemente a temperaturas de 12 a 13ºC.

36.1 **Comparison of freeze-drying and thermal dehydration of avocado pulp on quality parameters of cold-pressed avocado oil.** Isabelle Santana[1], Luciana M.F. Reis[1], Alexandre G. Torres[1], Lourdes M.C. Cabral[1], and Suely P. Freitas[1], [1]Universidade Federal do Rio de Janeiro (UFRJ), Av. Athos de Silveira Ramos, Rio de Janeiro, Brazil; [2]Embrapa Agroindústria de Alimentos, Av. Das Américas, 20501, Rio de Janeiro 23020470 Brazil

Due to the high water content in the avocado pulp, drying is usually adopted previously to oil extraction. However, the applied dehydration promotes sensitive changes in the composition and quality of the final product. Freeze-drying or lyophilization outstands as a non-thermal drying, providing advantages like maintenance of sensory aspects although may be more expensive than heat dehydration. The objective of this study consisted in the determination of acidity index (AI) and oxidative stability (OS) of avocado oil obtained from freeze and thermal dried avocado pulps. The Hass avocados were processed in the ripe maturation stage, where after disposal of peel and pits, the pulp was crushed and placed in trays to be dehydrated by freeze drying or by convective dryer at 60 °C with forced air circulation. Dried pulps were cold pressed and the oils evaluated for AI and OS, measured by the rancimat assay conducted at 110 °C and air flow of 20 L/h. The cold-pressed oil from freeze-dried avocados presented higher AI (0.69±0.07 % oleic acid) as compared to the oil obtained from hot air dehydrated pulps (0.43±0.13 %). This result can be linked to endogenous lipase, which activity is poorly affected by lyophilization process. The OS, expressed as induction period (hours), was equal to the oils obtained from lyophilized (7.9±0.8 h) and heat dried pulps (7.03±2.7 h). Regarding the evaluated parameters, freeze-drying did not show better performance compared to thermal dehydration, hence new evaluations must be done to check whether it protects the oil in different ways.

36.2 **Dry Fractionation of Pequi Oil (Caryocar brasiliense Camb.).** Renata Gomes de Brito Mariano[1], Bruno Ferreira Primo[1], Sonia Couri[2], Isabelle Santana[1], and Suely Pereira Freitas[1], [1]Universidade Federal do Rio de Janeiro (UFRJ), Av. Athos de Silveira Ramos, Rio de Janeiro, Brazil; [2]Instituto Federal do Rio de Janeiro, Rua Pereira de Almeida, 88, Rio de Janeiro, 2026000, Brazil.

The pequi (Caryocar brasiliense) is a tropical fruit of Brazil's Cerrado and presents high potential for oil extraction. In dry basis, the pequi pulp presents 50 % of lipids. Pequi oil is rich in carotenoids and contains a high proportion of oleic and palmitic acid. Dry fractionation, which separates, at specified temperature range, the liquid (olein) and solid (stearin) fractions of oils, is mainly used to modify the physic and chemical properties of lipids in order to extend its industrial applications. In the present study, dry fractionation of pequi oil was performed between 15 and 20 °C. Oxidative stability, thermal, physical and chemical properties of pequi oil and its fractions were investigated using Rancimat apparatus, differential scanning calorimetry (DSC) and gas chromatography (GC). The properties of fractionated end products were modified when compared to raw pequi oil. Due to higher concentrations in saturated fatty acids, the stearin presented a higher melting point (25 °C) as compared with olein (15°C) and pequi raw oil (19°C). Additionally, the resistance to oxidation (induction time) was much higher for the solid fraction (52 h) than for the liquid fraction (5 h). Thus, solid and liquid fractions, resulting from natural crystallization of pequi oil, would be suitable for formulation of new products with specific properties.