**Effect of nutrient-induced metabolic changes in rumen on milk fat and dissacharide formation of goat’s milk.**

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| **Input** | **Mechanism** | **Output** | |
| **Diet manipulation**  By using  -concentrates  -oil palm fronds  -palm oil empty fruit bunch  -seaweed | -to investigate the effect of diet on rumen fermentation characteristics | **Animal feed**  **-** Feed component and treatment feed proximate analysis  **-** In-vitro treatment feed analysis(digestibility, gas production)  **-** Fatty acid and volatile fatty acid analysis  **-** Rumen microbial population (cellulytic bacteria,  tot.bac,methanogens,protozoa).  -Carbohydrates analyses (polysaccharides: fucoidan, laminarins, alginic acid) | -CO2, Methane gas  -DNA extraction kit  -Thermosc qPCR sybr green (1k rxn=rm3k+,4k rxn=rm8k+)  -primer for qPCR, rm50±/pair  Carbohydrate analysis, Polyphenol. |
| **-**to investigate how diet affect lactating goats performance, milk production and milk composition. | **Animal trial (3-4 treatment; include 1 control), (15-20 animal)**  **-**DMI  **-**Milk yield, milk component analysis, milk fatty acid profile  **-**plasma glucose , NEFA, beta-hydroxybutyricacid, plasma fatty acid profile.  -milk TAG composition (C26-C54) HPLC/GC | -liq nitrogen  -Plasma β-HBA analyse by commercial diagnostic kit (Randox Laboratories Ltd.)  -(Fatty acid extraction techniques and GLC analysis.  -EM mammary structure |
| **-**to determine how nutrient-induced lactating goats affect milk fat synthesis and lactose synthesis. | **Molecular works**  -gene expression on milk quality (αs1-casein,αs2-casein,β-casein, kappa casein, whey protein gene α-lactalbumin (LALBA) and β-lactalbumin (BLG), progestagen-associated endometrial protein (PAEP:also known as β-lactoglabulin)  **-**Lipid (Milk fat synthesis)  -PPAR alpha/beta/gamma expression(mammary gland tissue through qPCR)  -PPAR isotope target gene: (FABP,LPL),  (ACACA,FASN,SCD)  **-**Glucose (Lactose synthesis)  - GLUT1, GLUT8,GLUT12 and SGLT1 mRNA  expression in mammary gland. | -RNeasy lipid tissue mini kit (Qiagen)  -RNA purifcation by RNase-Free DNase set  (Qiagen)  - Glucose transport |