

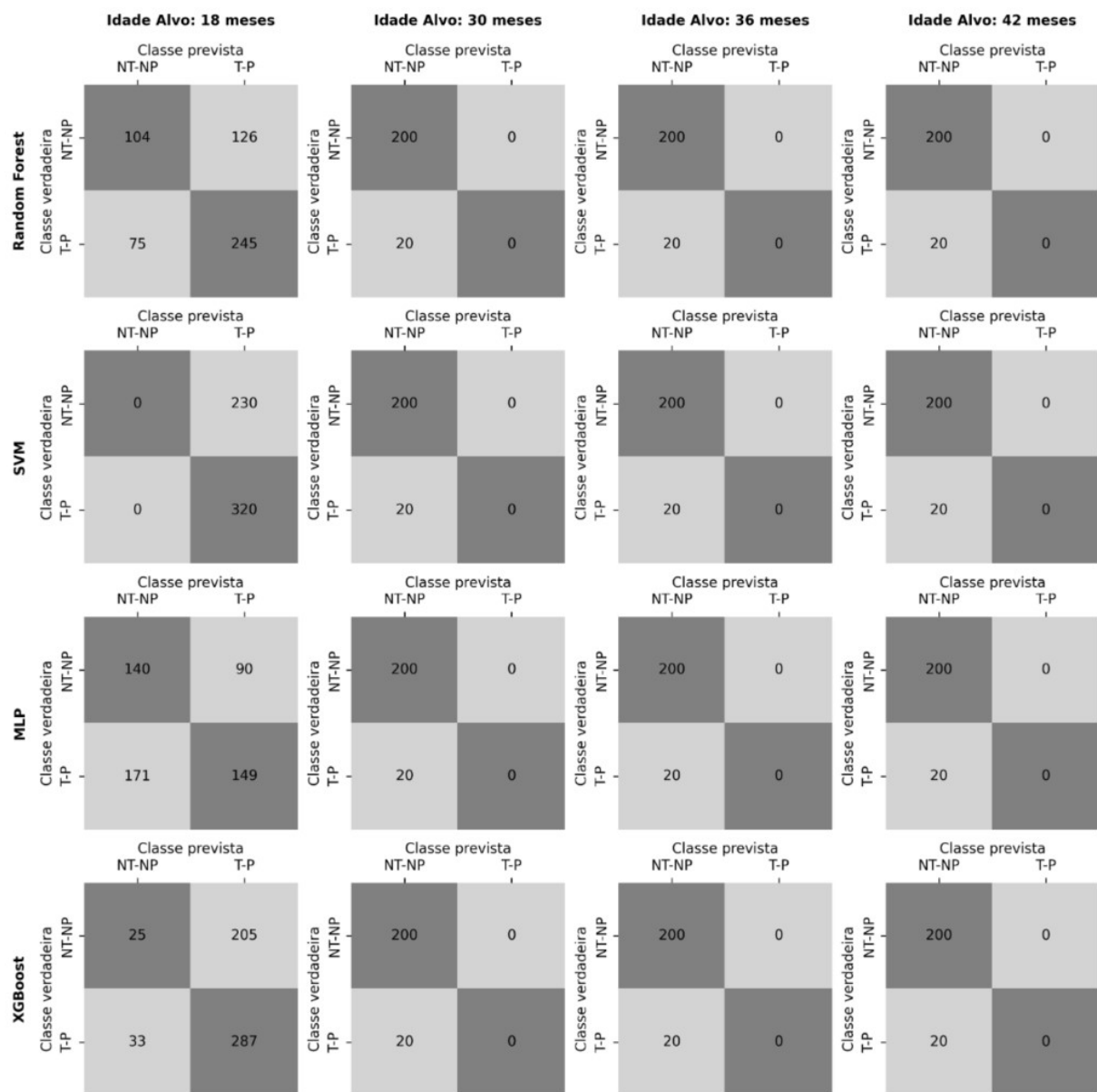
3.2 Tolerância e Produtividade - 2 classes

Tabela 7: Comparação do resultados dos algoritmos com os dados rotulados em duas classes de acordo com o critério de **Tolerância e Produtividade - 2 classes** em cada idade alvo.

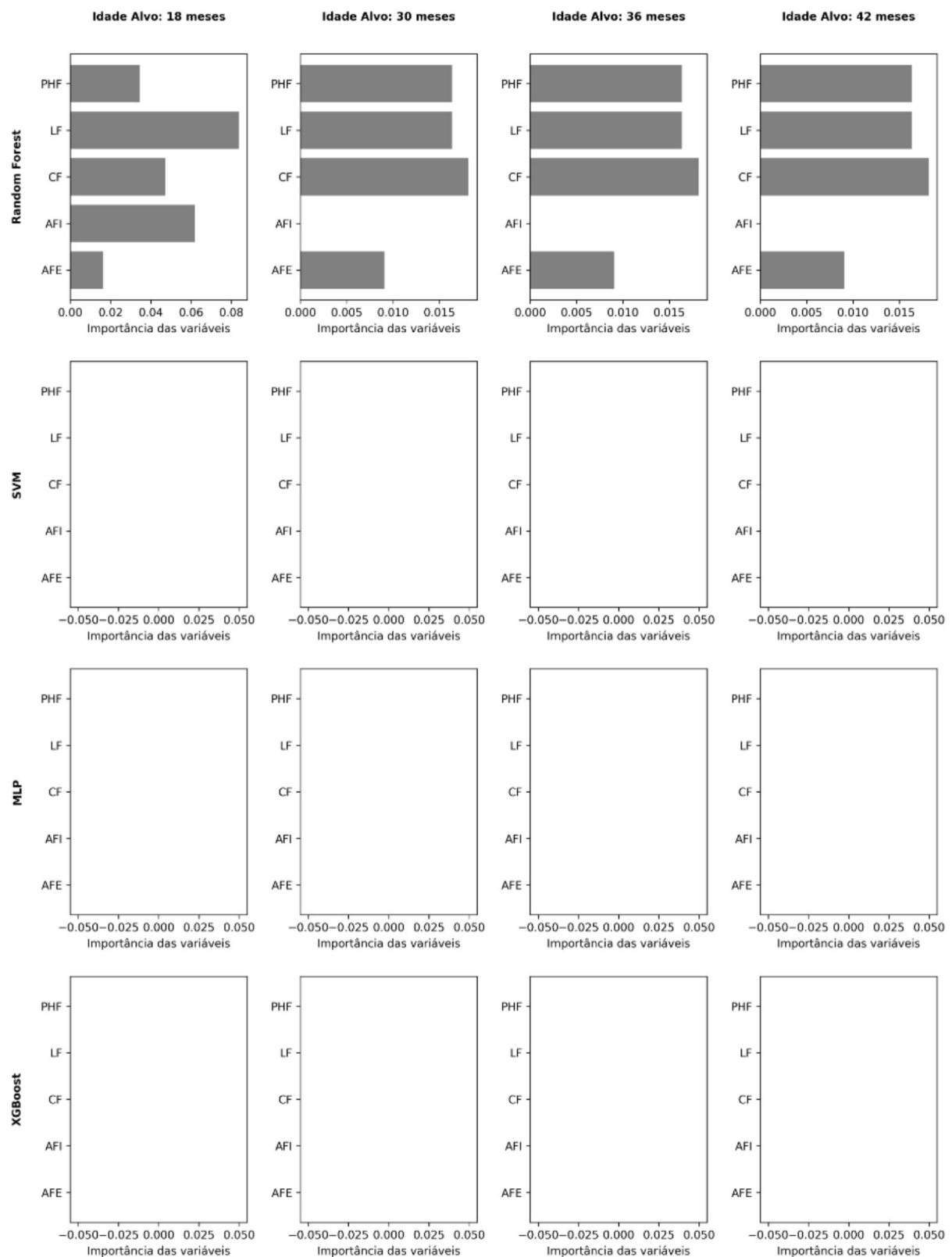
| Tolerância e Produtividade - 2 classes | | | | | |
|--|------------------|------------------|------------------|------------------|--------------------------|
| Modelo | Acurácia | Precisão | Recall | F1-Score | Acurácia B. ¹ |
| Idade Alvo: 18 meses | | | | | |
| Random Forest | 63.4±4.6 | 63.4±4.7 | 63.4±4.6 | 60.9±5.3 | 60.8±4.5 |
| MLP | 52.5±2.6 | 56.2±4.1 | 52.5±2.6 | 51.2±3.0 | 53.8±2.6 |
| XGBoost | 56.7±2.6 | 40.3±5.8 | 56.7±2.6 | 45.5±3.3 | 50.4±2.6 |
| SVC | 58.1±0.0 | 34.0±0.0 | 58.1±0.0 | 42.9±0.0 | 50.0±0.0 |
| Idade Alvo: 30 meses | | | | | |
| Random Forest | 96.36±0.0 | 93.06±0.0 | 96.36±0.0 | 94.63±0.0 | 80.00±0.0 |
| MLP | 96.36±0.0 | 93.06±0.0 | 96.36±0.0 | 94.63±0.0 | 80.00±0.0 |
| SVC | 96.36±0.0 | 93.06±0.0 | 96.36±0.0 | 94.63±0.0 | 80.00±0.0 |
| XGBoost | 96.36±0.0 | 93.06±0.0 | 96.36±0.0 | 94.63±0.0 | 80.00±0.0 |
| Idade Alvo: 36 meses | | | | | |
| Random Forest | 96.36±0.0 | 93.06±0.0 | 96.36±0.0 | 94.63±0.0 | 80.00±0.0 |
| MLP | 96.36±0.0 | 93.06±0.0 | 96.36±0.0 | 94.63±0.0 | 80.00±0.0 |
| SVC | 96.36±0.0 | 93.06±0.0 | 96.36±0.0 | 94.63±0.0 | 80.00±0.0 |
| XGBoost | 96.36±0.0 | 93.06±0.0 | 96.36±0.0 | 94.63±0.0 | 80.00±0.0 |
| Idade Alvo: 42 meses | | | | | |
| Random Forest | 96.36±0.0 | 93.06±0.0 | 96.36±0.0 | 94.63±0.0 | 80.00±0.0 |
| MLP | 96.36±0.0 | 93.06±0.0 | 96.36±0.0 | 94.63±0.0 | 80.00±0.0 |
| SVC | 96.36±0.0 | 93.06±0.0 | 96.36±0.0 | 94.63±0.0 | 80.00±0.0 |
| XGBoost | 96.36±0.0 | 93.06±0.0 | 96.36±0.0 | 94.63±0.0 | 80.00±0.0 |

1 - Acurácia Balanceada

Matriz de confusão 2 classes - tolerância e produtividade



Importância das variáveis 2 classes - tolerância e produtividade



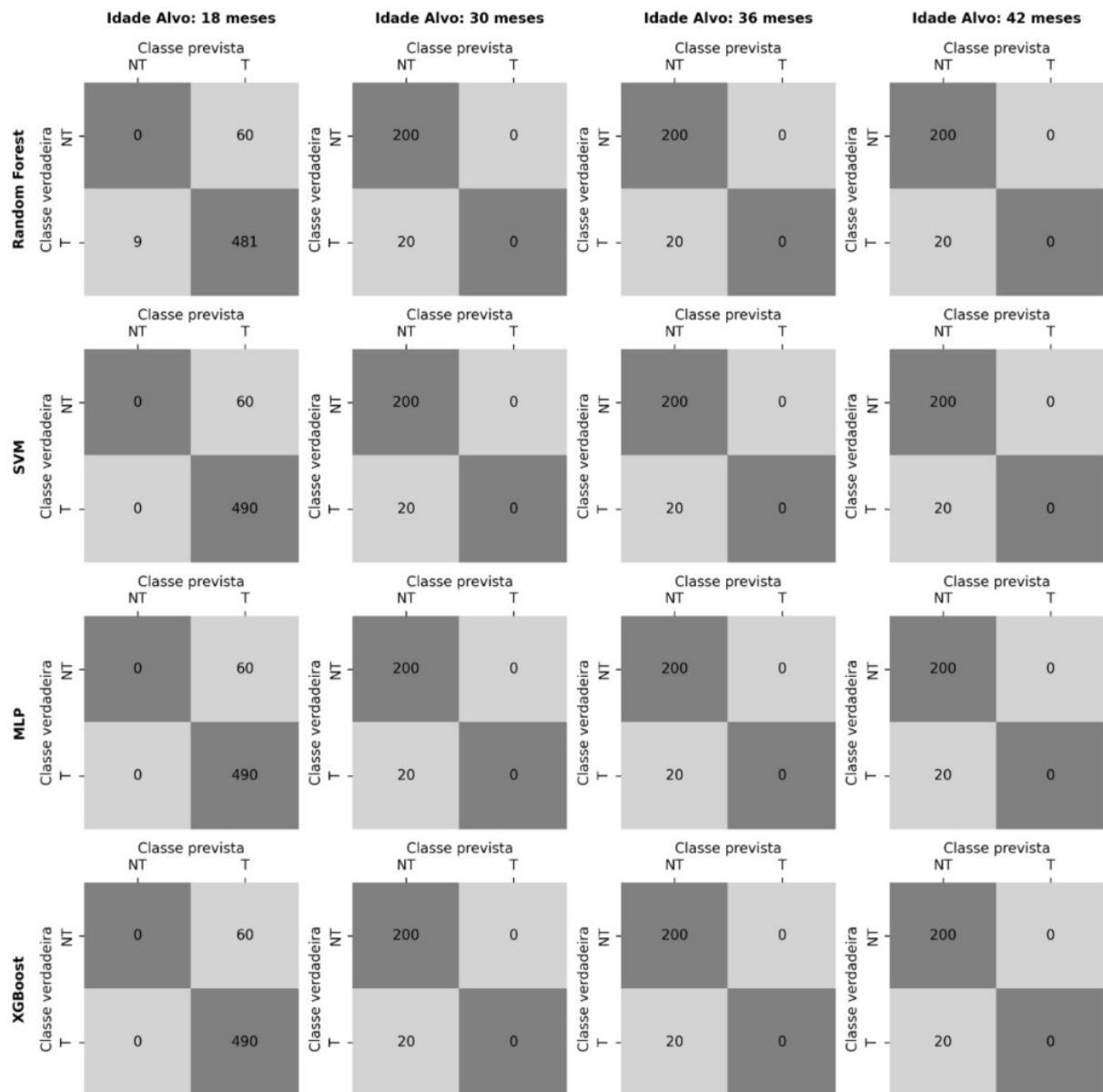
3.3 Tolerância - 2 classes

Tabela 8: Comparação do resultados dos algoritmos com os dados rotulados em duas classes de acordo com o critério de **Tolerância - 2 classes** em cada idade alvo.

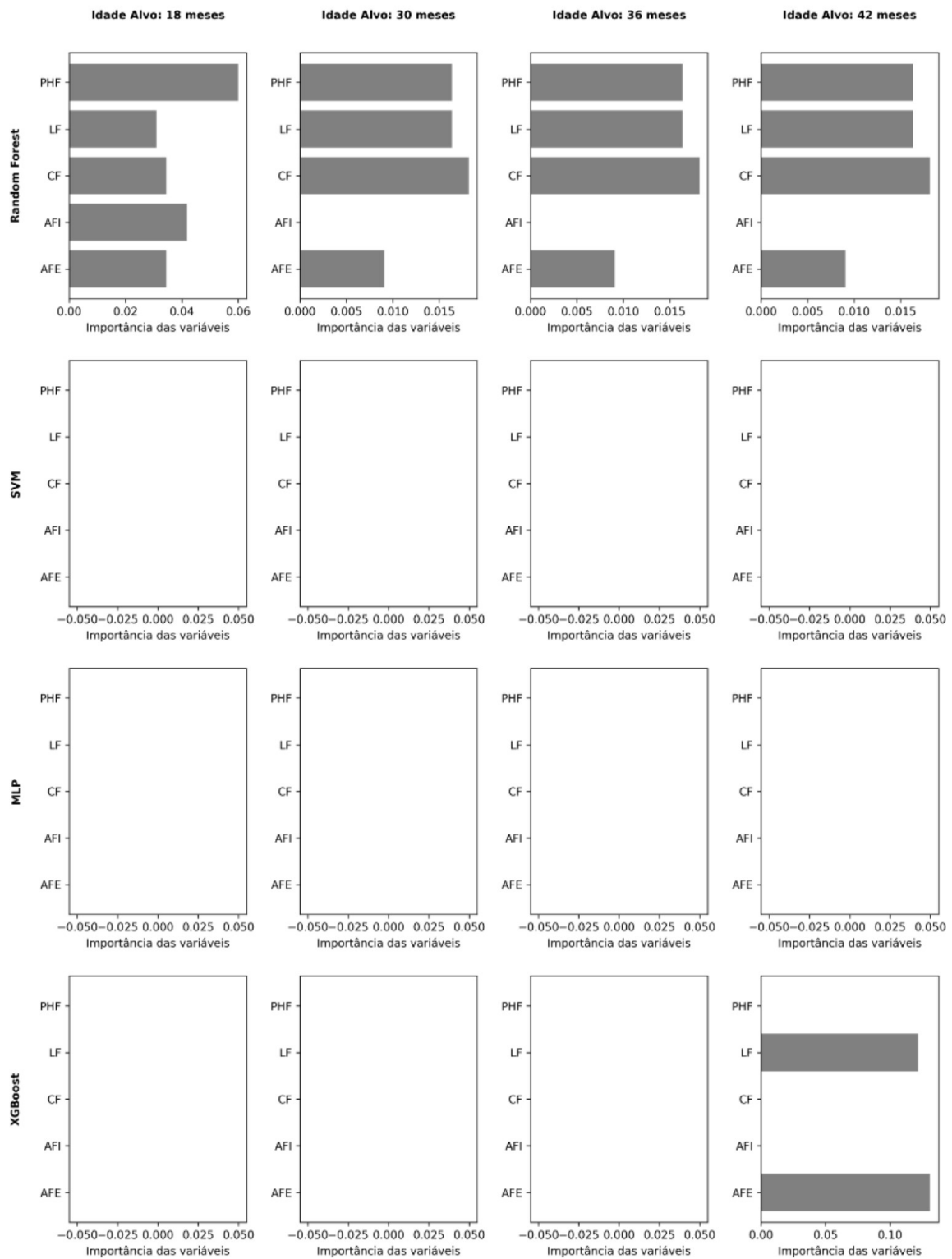
| Tolerância - 2 classes | | | | | |
|------------------------|------------------|------------------|------------------|------------------|--------------------------|
| Modelo | Acurácia | Precisão | Recall | F1-Score | Acurácia B. ¹ |
| Idade Alvo: 18 meses | | | | | |
| MLP | 89.09±0.0 | 79.50±0.0 | 89.09±0.0 | 83.99±0.0 | 50.00±0.0 |
| SVC | 89.09±0.0 | 79.50±0.0 | 89.09±0.0 | 83.99±0.0 | 50.00±0.0 |
| XGBoost | 89.09±0.0 | 79.50±0.0 | 89.09±0.0 | 83.99±0.0 | 50.00±0.0 |
| Random Forest | 87.45±1.81 | 79.33±0.20 | 87.45±1.81 | 83.13±0.97 | 49.08±1.01 |
| Idade Alvo: 30 meses | | | | | |
| Random Forest | 96.36±0.0 | 93.06±0.0 | 96.36±0.0 | 94.63±0.0 | 80.00±0.0 |
| MLP | 96.36±0.0 | 93.06±0.0 | 96.36±0.0 | 94.63±0.0 | 80.00±0.0 |
| SVC | 96.36±0.0 | 93.06±0.0 | 96.36±0.0 | 94.63±0.0 | 80.00±0.0 |
| XGBoost | 96.36±0.0 | 93.06±0.0 | 96.36±0.0 | 94.63±0.0 | 80.00±0.0 |
| Idade Alvo: 36 meses | | | | | |
| SVC | 96.36±0.0 | 93.06±0.0 | 96.36±0.0 | 94.63±0.0 | 80.00±0.0 |
| Random Forest | 96.36±0.0 | 93.06±0.0 | 96.36±0.0 | 94.63±0.0 | 80.00±0.0 |
| MLP | 96.36±0.0 | 93.06±0.0 | 96.36±0.0 | 94.63±0.0 | 80.00±0.0 |
| XGBoost | 96.36±0.0 | 93.06±0.0 | 96.36±0.0 | 94.63±0.0 | 80.00±0.0 |
| Idade Alvo: 42 meses | | | | | |
| SVC | 96.36±0.0 | 93.06±0.0 | 96.36±0.0 | 94.63±0.0 | 80.00±0.0 |
| Random Forest | 96.36±0.0 | 93.06±0.0 | 96.36±0.0 | 94.63±0.0 | 80.00±0.0 |
| MLP | 96.36±0.0 | 93.06±0.0 | 96.36±0.0 | 94.63±0.0 | 80.00±0.0 |
| XGBoost | 96.36±0.0 | 93.06±0.0 | 96.36±0.0 | 94.63±0.0 | 80.00±0.0 |

1 - Acurácia Balanceada

Matriz de confusão 2 classes - tolerância



Importância das variáveis 2 classes - tolerância



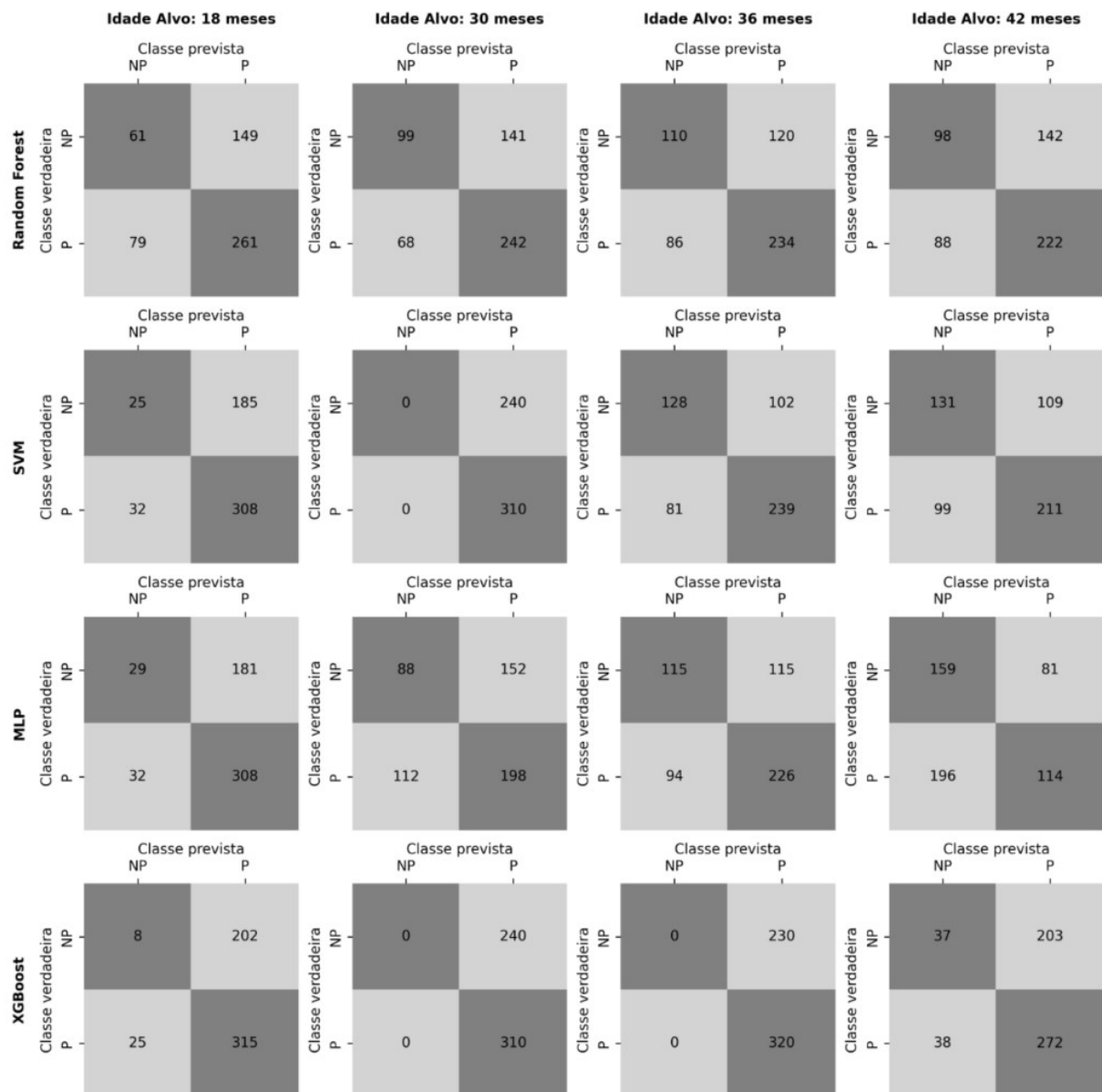
3.4 Produtividade - 2 classes

Tabela 9: Comparação do resultados dos algoritmos com os dados rotulados em duas classes de acordo com o critério de **Produtividade - 2 classes** em cada idade alvo.

| Produtividade - 2 classes | | | | | |
|---------------------------|-------------------|-------------------|-------------------|-------------------|--------------------------|
| Modelo | Acurácia | Precisão | Recall | F1-Score | Acurácia B. ¹ |
| Idade Alvo: 18 meses | | | | | |
| Random Forest | 58.55±3.18 | 55.84±6.34 | 58.55±3.18 | 54.24±3.71 | 53.00±3.92 |
| MLP | 61.27±3.33 | 52.26±6.90 | 61.27±3.33 | 52.67±4.07 | 52.53±3.34 |
| SVC | 60.55±2.58 | 52.02±5.82 | 60.55±2.58 | 52.15±2.87 | 51.53±2.60 |
| XGBoost | 58.73±2.43 | 38.37±1.10 | 58.73±2.43 | 45.85±1.46 | 48.28±1.72 |
| Idade Alvo: 30 meses | | | | | |
| Random Forest | 62.00±6.03 | 62.77±8.43 | 62.00±6.03 | 59.15±6.98 | 59.70±6.39 |
| MLP | 52.00±7.23 | 51.25±9.62 | 52.00±7.23 | 50.26±7.89 | 50.43±7.55 |
| SVC | 56.36±0.0 | 31.90±0.0 | 56.36±0.0 | 40.70±0.0 | 50.00±0.0 |
| XGBoost | 56.36±0.0 | 31.90±0.0 | 56.36±0.0 | 40.70±0.0 | 50.00±0.0 |
| Idade Alvo: 36 meses | | | | | |
| SVC | 66.73±3.21 | 68.49±4.18 | 66.73±3.21 | 65.44±3.53 | 65.04±3.0 |
| Random Forest | 62.55±4.39 | 64.17±4.71 | 62.55±4.39 | 60.81±4.39 | 60.45±4.67 |
| MLP | 62.00±3.14 | 62.99±4.17 | 62.00±3.14 | 60.69±3.12 | 60.28±3.38 |
| XGBoost | 58.18±0.0 | 34.05±0.0 | 58.18±0.0 | 42.90±0.0 | 50.0±0.0 |
| Idade Alvo: 42 meses | | | | | |
| SVC | 62.18±5.61 | 62.94±5.92 | 62.18±5.61 | 61.06±5.52 | 61.50±5.90 |
| Random Forest | 58.18±5.14 | 57.89±6.08 | 58.18±5.14 | 56.35±5.04 | 56.44±5.18 |
| MLP | 49.64±2.43 | 53.08±5.20 | 49.64±2.43 | 47.40±3.44 | 51.90±2.11 |
| XGBoost | 56.18±3.02 | 43.95±7.18 | 56.18±3.02 | 46.81±4.28 | 51.46±3.17 |

¹ - Acurácia Balanceada

Matriz de confusão 2 classes - produtividade



Importância das variáveis - 2 classes produtividade

